



SEQUENCE LISTING

<10> DeJong, Jan
Fouchier, Ronaldus
Van Den Hoogen, Bernadetta
Osterhaus, Albertus
Groen, Jan

<120> Virus causing respiratory tract illness in susceptible mammals

<130> 7862-108-999

<140> 10/722,045
<141> 2003-11-25

<150> PCT/NL02/00040
<151> 2002-01-18

<150> EP01200213.5
<151> 2001-01-19

<150> EP01203985.5
<151> 2001-10-18

<160> 172

<170> PatentIn version 3.2

<210> 1
<211> 394
<212> PRT
<213> Human metapneumovirus 00-1

<400> 1

Met Ser Leu Gln Gly Ile His Leu Ser Asp Leu Ser Tyr Lys His Ala
1 5 10 15

Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg Asp Val Gly Thr Thr
20 25 30

Thr Ala Val Thr Pro Ser Ser Leu Gln Gln Glu Ile Thr Leu Leu Cys
35 40 45

Gly Glu Ile Leu Tyr Ala Lys His Ala Asp Tyr Lys Tyr Ala Ala Glu
50 55 60

Ile Gly Ile Gln Tyr Ile Ser Thr Ala Leu Gly Ser Glu Arg Val Gln
65 70 75 80

Gln Ile Leu Arg Asn Ser Gly Ser Glu Val Gln Val Val Leu Thr Arg
85 90 95

Thr Tyr Ser Leu Gly Lys Ile Lys Asn Asn Lys Gly Glu Asp Leu Gln
100 105 110

Met Leu Asp Ile His Gly Val Glu Lys Ser Trp Val Glu Glu Ile Asp
 115 120 125

Lys Glu Ala Arg Lys Thr Met Ala Thr Leu Leu Lys Glu Ser Ser Gly
 130 135 140

Asn Ile Pro Gln Asn Gln Arg Pro Ser Ala Pro Asp Thr Pro Ile Ile
 145 150 155 160

Leu Leu Cys Val Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Ile
 165 170 175

Glu Val Gly Leu Glu Thr Thr Val Arg Arg Ala Asn Arg Val Leu Ser
 180 185 190

Asp Ala Leu Lys Arg Tyr Pro Arg Met Asp Ile Pro Lys Ile Ala Arg
 195 200 205

Ser Phe Tyr Asp Leu Phe Glu Gln Lys Val Tyr His Arg Ser Leu Phe
 210 215 220

Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser Thr Gly Ser Lys Ala
 225 230 235 240

Glu Ser Leu Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln
 245 250 255

Thr Met Leu Arg Trp Gly Val Ile Ala Arg Ser Ser Asn Asn Ile Met
 260 265 270

Leu Gly His Val Ser Val Gln Ala Glu Leu Lys Gln Val Thr Glu Val
 275 280 285

Tyr Asp Leu Val Arg Glu Met Gly Pro Glu Ser Gly Leu Leu His Leu
 290 295 300

Arg Gln Ser Pro Lys Ala Gly Leu Leu Ser Leu Ala Asn Cys Pro Asn
 305 310 315 320

Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly Leu Gly Ile Ile Gly
 325 330 335

Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu Phe Ser Ala Ala Glu
 340 345 350

Ser Tyr Ala Lys Ser Leu Lys Glu Ser Asn Lys Ile Asn Phe Ser Ser
 355 360 365

Leu Gly Leu Thr Asp Glu Glu Lys Glu Ala Ala Glu His Phe Leu Asn
 370 375 380

Val Ser Asp Asp Ser Gln Asn Asp Tyr Glu
 385 390

<210> 2
 <211> 391
 <212> PRT
 <213> Avian pneumovirus A

<400> 2

Met Ser Leu Glu Ser Ile Arg Leu Ser Asp Leu Glu Tyr Lys His Ala
 1 5 10 15

Ile Leu Glu Asp Ser Gln Tyr Thr Ile Arg Arg Asp Val Gly Ala Thr
 20 25 30

Thr Ala Ile Thr Pro Ser Glu Leu Gln Pro Gln Val Ser Thr Leu Cys
 35 40 45

Gly Met Val Leu Phe Ala Lys His Thr Asp Tyr Glu Pro Ala Ala Glu
 50 55 60

Val Gly Met Gln Tyr Ile Ser Thr Ala Leu Gly Ala Asp Arg Thr Gln
 65 70 75 80

Gln Ile Leu Lys Asn Ser Gly Ser Glu Val Gln Gly Val Met Thr Lys
 85 90 95

Ile Val Thr Leu Ser Ala Glu Gly Ser Val Arg Lys Arg Glu Val Leu
 100 105 110

Asn Ile His Asp Val Gly Val Gly Trp Ala Asp Asp Val Glu Arg Thr
 115 120 125

Thr Arg Glu Ala Met Gly Ala Met Val Arg Glu Lys Val Gln Leu Thr
 130 135 140

Lys Asn Gln Lys Pro Ser Ala Leu Asp Ala Pro Val Ile Leu Leu Cys
 145 150 155 160

Ile Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Val Glu Val Gly
 165 170 175
 Leu Glu Thr Ala Ile Arg Arg Ala Ser Arg Val Leu Ser Asp Ala Ile
 180 185 190
 Ser Arg Tyr Pro Arg Met Asp Ile Pro Arg Ile Ala Lys Ser Phe Phe
 195 200 205
 Glu Leu Phe Glu Lys Lys Val Tyr Tyr Arg Asn Leu Phe Ile Glu Tyr
 210 215 220
 Gly Lys Ala Leu Gly Ser Thr Ser Thr Gly Ser Arg Met Glu Ser Leu
 225 230 235 240
 Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln Thr Met Leu
 245 250 255
 Arg Trp Gly Val Ile Ala Arg Ser Ser Asn Asn Ile Met Leu Gly His
 260 265 270
 Val Ser Val Gln Ala Glu Leu Arg Gln Val Ser Glu Val Tyr Asp Leu
 275 280 285
 Val Arg Lys Met Gly Pro Glu Ser Gly Leu Leu His Leu Arg Gln Ser
 290 295 300
 Pro Lys Ala Gly Leu Leu Ser Leu Thr Asn Cys Pro Asn Phe Ala Ser
 305 310 315 320
 Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Ile Gly Met Tyr Lys
 325 330 335
 Gly Arg Ala Pro Asn Leu Glu Leu Phe Ala Ala Ala Glu Ser Tyr Ala
 340 345 350
 Arg Thr Leu Arg Glu Asn Asn Lys Ile Asn Leu Ala Ala Leu Gly Leu
 355 360 365
 Thr Asp Asp Glu Arg Glu Ala Ala Thr Ser Tyr Leu Gly Gly Asp Asp
 370 375 380
 Glu Arg Ser Ser Lys Phe Glu
 385 390

<210> 3

<211> 391
 <212> PRT
 <213> Avian pneumovirus B

<400> 3

Met Ser Leu Glu Ser Ile Arg Leu Ser Asp Leu Glu Tyr Lys His Ala
 1 5 10 15

Ile Leu Asp Glu Ser Gln Tyr Thr Ile Arg Arg Asp Val Gly Ala Thr
 20 25 30

Thr Ala Ile Thr Pro Ser Glu Leu Gln Pro Lys Val Ser Thr Leu Cys
 35 40 45

Gly Met Ile Leu Phe Ala Lys His Ala Asp Tyr Glu Pro Ala Ala Gln
 50 55 60

Val Gly Met Gln Tyr Ile Ser Thr Ala Leu Gly Ala Asp Lys Thr Gln
 65 70 75 80

Gln Ile Leu Lys Ser Ser Gly Ser Glu Val Gln Gly Val Met Thr Lys
 85 90 95

Ile Val Thr Leu Pro Ala Glu Gly Pro Ile Arg Lys Arg Glu Val Leu
 100 105 110

Asn Ile His Asp Ile Gly Pro Ala Trp Ala Asp Asn Val Glu Arg Thr
 115 120 125

Ala Arg Glu Thr Met Ser Leu Met Val Lys Glu Lys Ala Gln Ile Pro
 130 135 140

Lys Asn Gln Lys Pro Ser Ala Leu Asp Ala Pro Val Ile Leu Leu Cys
 145 150 155 160

Ile Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Val Glu Val Gly
 165 170 175

Leu Glu Thr Ala Ile Arg Arg Ala Ser Arg Val Leu Ser Asp Ala Ile
 180 185 190

Ser Arg Tyr Pro Arg Met Asp Ile Pro Arg Ile Ala Lys Ser Phe Phe
 195 200 205

Glu Leu Phe Glu Lys Lys Val Tyr Tyr Arg Asn Leu Phe Ile Glu Tyr
 210 215 220

Gly Lys Ala Leu Gly Ser Thr Ser Ser Gly Ser Arg Met Glu Ser Leu
 225 230 235 240

Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln Thr Met Leu
 245 250 255

Arg Arg Gly Val Val Ala Arg Ser Ser Asn Asn Ile Met Leu Gly His
 260 265 270

Val Ser Val Gln Ala Glu Leu Arg Gln Val Ser Glu Val Tyr Asp Leu
 275 280 285

Val Arg Lys Met Gly Pro Glu Ser Gly Leu Leu His Leu Arg Gln Ser
 290 295 300

Pro Lys Ala Gly Leu Leu Ser Leu Thr Ser Cys Pro Asn Phe Ala Ser
 305 310 315 320

Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Ile Gly Met Tyr Lys
 325 330 335

Gly Arg Ala Pro Asn Leu Glu Leu Phe Ser Ala Ala Glu Ser Tyr Ala
 340 345 350

Arg Ser Leu Lys Glu Ser Asn Lys Ile Asn Leu Ala Ala Leu Gly Leu
 355 360 365

Thr Glu Asp Glu Arg Glu Ala Ala Thr Ser Tyr Leu Gly Gly Asp Glu
 370 375 380

Asp Lys Ser Gln Lys Phe Glu
 385 390

<210> 4
 <211> 394
 <212> PRT
 <213> Avian pneumovirus C

<400> 4

Met Ser Leu Gln Gly Ile Gln Leu Ser Asp Leu Ser Tyr Lys His Ala
 1 5 10 15

Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg Asp Val Gly Thr Thr
 20 25 30

Thr Ala Val Thr Pro Ser Ser Leu Gln Arg Glu Val Ser Leu Leu Cys
 35 40 45

Gly Glu Ile Leu Tyr Ala Lys His Thr Asp Tyr Ser His Ala Ala Glu
 50 55 60

Val Gly Met Gln Tyr Val Ser Thr Thr Leu Gly Ala Glu Arg Thr Gln
 65 70 75 80

Gln Ile Leu Lys Asn Ser Gly Ser Glu Val Gln Ala Val Leu Thr Lys
 85 90 95

Thr Tyr Ser Leu Gly Lys Gly Lys Asn Ser Lys Gly Glu Glu Leu Gln
 100 105 110

Met Leu Asp Ile His Gly Val Glu Arg Ser Trp Ile Glu Glu Val Asp
 115 120 125

Lys Glu Ala Arg Lys Thr Met Ala Ser Ala Thr Lys Asp Asn Ser Gly
 130 135 140

Pro Ile Pro Gln Asn Gln Arg Pro Ser Ser Pro Asp Ala Pro Ile Ile
 145 150 155 160

Leu Leu Cys Ile Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Ile
 165 170 175

Glu Val Gly Leu Glu Thr Ala Val Arg Arg Ala Asn Arg Val Leu Asn
 180 185 190

Asp Ala Leu Lys Arg Phe Pro Arg Ile Asp Ile Pro Lys Ile Ala Arg
 195 200 205

Ser Phe Tyr Asp Leu Phe Glu Gln Lys Val Tyr Tyr Arg Ser Leu Phe
 210 215 220

Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser Thr Gly Ser Lys Ala
 225 230 235 240

Glu Ser Leu Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln
 245 250 255

Thr Met Leu Arg Trp Gly Val Ile Ala Arg Ser Ser Asn Asn Ile Met
 260 265 270

Leu Gly His Val Ser Val Gln Ala Glu Leu Lys Gln Val Thr Glu Val
 275 280 285

Tyr Asp Leu Val Arg Glu Met Gly Pro Glu Ser Gly Leu Leu His Leu
 290 295 300

Arg Gln Asn Pro Lys Ala Gly Leu Leu Ser Leu Ala Asn Cys Pro Asn
 305 310 315 320

Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly Leu Gly Ile Leu Gly
 325 330 335

Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu Phe Ala Ala Ala Glu
 340 345 350

Ser Tyr Ala Arg Ser Leu Lys Glu Ser Asn Lys Ile Asn Phe Ser Ser
 355 360 365

Leu Gly Leu Thr Glu Glu Glu Lys Glu Ala Ala Glu Asn Phe Leu Asn
 370 375 380

Ile Asn Glu Glu Gly Gln Asn Asp Tyr Glu
 385 390

<210> 5
 <211> 391
 <212> PRT
 <213> Bovine respiratory syncytial virus
 <400> 5

Met Ala Leu Ser Lys Val Lys Leu Asn Asp Thr Phe Asn Lys Asp Gln
 1 5 10 15

Leu Leu Ser Thr Ser Lys Tyr Thr Ile Gln Arg Ser Thr Gly Asp Asn
 20 25 30

Ile Asp Ile Pro Asn Tyr Asp Val Gln Lys His Leu Asn Lys Leu Cys
 35 40 45

Gly Met Leu Leu Ile Thr Glu Asp Ala Asn His Lys Phe Thr Gly Leu
 50 55 60

Ile Gly Met Leu Tyr Ala Met Ser Arg Leu Gly Arg Glu Asp Thr Leu
 65 70 75 80

Lys Ile Leu Lys Asp Ala Gly Tyr Gln Val Arg Ala Asn Gly Val Asp
 85 90 95

Tyr Arg Gly Thr Pro Arg Asn Gln Asp Leu Tyr Asp Ala Ala Lys Ala
 340 345 350

Tyr Ala Glu Gln Leu Lys Glu Asn Gly Val Ile Asn Tyr Ser Val Leu
 355 360 365

Asp Leu Thr Thr Glu Glu Leu Glu Ala Ile Lys Asn Gln Leu Asn Pro
 370 375 380

Lys Asp Asn Asp Val Glu Leu
 385 390

<210> 6
 <211> 391
 <212> PRT
 <213> Human respiratory syncytial virus

<400> 6

Met Ala Leu Ser Lys Val Lys Leu Asn Asp Thr Leu Asn Lys Asp Gln
 1 5 10 15

Leu Leu Ser Ser Ser Lys Tyr Thr Ile Gln Arg Ser Thr Gly Asp Asn
 20 25 30

Ile Asp Thr Pro Asn Tyr Asp Val Gln Lys His Leu Asn Lys Leu Cys
 35 40 45

Gly Met Leu Leu Ile Thr Glu Asp Ala Asn His Lys Phe Thr Gly Leu
 50 55 60

Ile Gly Met Leu Tyr Ala Met Ser Arg Leu Gly Arg Glu Asp Thr Ile
 65 70 75 80

Lys Ile Leu Lys Asp Ala Gly Tyr His Val Lys Ala Asn Gly Val Asp
 85 90 95

Ile Thr Thr Tyr Arg Gln Asp Ile Asn Gly Lys Glu Met Lys Phe Glu
 100 105 110

Val Leu Thr Leu Ser Ser Leu Thr Ser Glu Ile Gln Val Asn Ile Glu
 115 120 125

Ile Glu Ser Arg Lys Ser Tyr Lys Lys Met Leu Lys Glu Met Gly Glu
 130 135 140

Val	Ala	Pro	Glu	Tyr	Arg	His	Asp	Ser	Pro	Asp	Cys	Gly	Met	Ile	Ile	145	150	155	160
Leu	Cys	Ile	Ala	Ala	Leu	Val	Ile	Thr	Lys	Leu	Ala	Ala	Gly	Asp	Arg	165	170	175	
Ser	Gly	Leu	Thr	Ala	Val	Ile	Arg	Arg	Ala	Asn	Asn	Val	Leu	Lys	Asn	180	185	190	
Glu	Ile	Lys	Arg	Tyr	Lys	Gly	Leu	Ile	Pro	Lys	Asp	Ile	Ala	Asn	Ser	195	200	205	
Phe	Tyr	Glu	Val	Phe	Glu	Lys	His	Pro	His	Leu	Ile	Asp	Val	Phe	Val	210	215	220	
His	Phe	Gly	Ile	Ala	Gln	Ser	Ser	Thr	Arg	Gly	Gly	Ser	Arg	Val	Glu	225	230	235	240
Gly	Ile	Phe	Ala	Gly	Leu	Phe	Met	Asn	Ala	Tyr	Gly	Ser	Gly	Gln	Val	245	250	255	
Met	Leu	Arg	Trp	Gly	Val	Leu	Ala	Lys	Ser	Val	Lys	Asn	Ile	Met	Leu	260	265	270	
Gly	His	Ala	Ser	Val	Gln	Ala	Glu	Met	Glu	Gln	Val	Val	Glu	Val	Tyr	275	280	285	
Glu	Tyr	Ala	Gln	Lys	Leu	Gly	Gly	Glu	Ala	Gly	Phe	Tyr	His	Ile	Leu	290	295	300	
Asn	Asn	Pro	Lys	Ala	Ser	Leu	Leu	Ser	Leu	Thr	Gln	Phe	Pro	Asn	Phe	305	310	315	320
Ser	Ser	Val	Val	Leu	Gly	Asn	Ala	Ala	Gly	Leu	Gly	Ile	Met	Gly	Glu	325	330	335	
Tyr	Arg	Gly	Thr	Pro	Arg	Asn	Gln	Asp	Leu	Tyr	Asp	Ala	Ala	Lys	Ala	340	345	350	
Tyr	Ala	Glu	Gln	Leu	Lys	Glu	Asn	Gly	Val	Ile	Asn	Tyr	Ser	Val	Leu	355	360	365	
Asp	Leu	Thr	Ala	Glu	Glu	Leu	Glu	Ala	Ile	Lys	Asn	Gln	Leu	Asn	Pro	370	375	380	

Lys Glu Asp Asp Val Glu Leu
385 390

<210> 7
<211> 393
<212> PRT
<213> Pneumonia virus of mice

<400> 7

Met Ser Leu Asp Arg Leu Lys Leu Asn Asp Val Ser Asn Lys Asp Ser
1 5 10 15

Leu Leu Ser Asn Cys Lys Tyr Ser Val Thr Arg Ser Thr Gly Asp Val
20 25 30

Thr Ser Val Ser Gly His Ala Met Gln Lys Ala Leu Ala Arg Thr Leu
35 40 45

Gly Met Phe Leu Leu Thr Ala Phe Asn Arg Cys Glu Glu Val Ala Glu
50 55 60

Ile Gly Leu Gln Tyr Ala Met Ser Leu Leu Gly Arg Asp Asp Ser Ile
65 70 75 80

Lys Ile Leu Arg Glu Ala Gly Tyr Asn Val Lys Cys Val Asp Thr Gln
85 90 95

Leu Lys Asp Phe Thr Ile Lys Leu Gln Gly Lys Glu Tyr Lys Ile Gln
100 105 110

Val Leu Asp Ile Val Gly Ile Asp Ala Ala Asn Leu Ala Asp Leu Glu
115 120 125

Ile Gln Ala Arg Gly Val Val Ala Lys Glu Leu Lys Thr Gly Ala Arg
130 135 140

Leu Pro Asp Asn Arg Arg His Asp Ala Pro Asp Cys Gly Val Ile Val
145 150 155 160

Leu Cys Ile Ala Ala Leu Val Val Ser Lys Leu Ala Ala Gly Asp Arg
165 170 175

Gly Gly Leu Asp Ala Val Glu Arg Arg Ala Leu Asn Val Leu Lys Ala
180 185 190

Glu Lys Ala Arg Tyr Pro Asn Met Glu Val Lys Gln Ile Ala Glu Ser
 195 200 205

Phe Tyr Asp Leu Phe Glu Arg Lys Pro Tyr Tyr Ile Asp Val Phe Ile
 210 215 220

Thr Phe Gly Leu Ala Gln Ser Ser Val Arg Gly Gly Ser Lys Val Glu
 225 230 235 240

Gly Leu Phe Ser Gly Leu Phe Met Asn Ala Tyr Gly Ala Gly Gln Val
 245 250 255

Met Leu Arg Trp Gly Leu Leu Ala Lys Ser Val Lys Asn Ile Met Leu
 260 265 270

Gly His Ala Ser Val Gln Ala Glu Met Glu Gln Val Val Glu Val Tyr
 275 280 285

Glu Tyr Ala Gln Lys Gln Gly Gly Glu Ala Gly Phe Tyr His Ile Arg
 290 295 300

Asn Asn Pro Lys Ala Ser Leu Leu Ser Leu Thr Asn Cys Pro Asn Phe
 305 310 315 320

Thr Ser Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Ile Gly Ser
 325 330 335

Tyr Lys Gly Ala Pro Arg Asn Arg Glu Leu Phe Asp Ala Ala Lys Asp
 340 345 350

Tyr Ala Glu Arg Leu Lys Asp Asn Asn Val Ile Asn Tyr Ser Ala Leu
 355 360 365

Asn Leu Thr Ala Glu Glu Arg Glu Leu Ile Ser Gln Gln Leu Asn Ile
 370 375 380

Val Asp Asp Thr Pro Asp Asp Asp Ile
 385 390

<210> 8
 <211> 294
 <212> PRT
 <213> Human metapneumovirus 00-1

<400> 8

Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
1 5 10 15

Ala Lys Leu Ala Glu Ala Phe Gln Lys Ser Leu Arg Lys Pro Gly His
20 25 30

Lys Arg Ser Gln Ser Ile Ile Gly Glu Lys Val Asn Thr Val Ser Glu
35 40 45

Thr Leu Glu Leu Pro Thr Ile Ser Arg Pro Ala Lys Pro Thr Ile Pro
50 55 60

Ser Glu Pro Lys Leu Ala Trp Thr Asp Lys Gly Gly Ala Thr Lys Thr
65 70 75 80

Glu Ile Lys Gln Ala Ile Lys Val Met Asp Pro Ile Glu Glu Glu Glu
85 90 95

Ser Thr Glu Lys Lys Val Leu Pro Ser Ser Asp Gly Lys Thr Pro Ala
100 105 110

Glu Lys Lys Leu Lys Pro Ser Thr Asn Thr Lys Lys Lys Val Ser Phe
115 120 125

Thr Pro Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu
130 135 140

Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu
145 150 155 160

Thr Phe Glu Glu Arg Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu
165 170 175

Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr
180 185 190

Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
195 200 205

Asp Ala Met Ile Gly Val Arg Glu Glu Leu Ile Ala Asp Ile Ile Lys
210 215 220

Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Ser Gln
225 230 235 240

Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
245 250 255

Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
260 265 270

Glu Glu Glu Glu Pro Lys Asp Thr Gln Asp Asn Ser Gln Glu Asp Asp
275 280 285

Ile Tyr Gln Leu Ile Met
290

<210> 9
<211> 278
<212> PRT
<213> Avian pneumovirus A

<400> 9

Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Met Met Gly Ser Glu Ala
1 5 10 15

Ala Lys Met Ala Asp Ala Tyr Gln Arg Ser Leu Arg Asn Thr Ser Ala
20 25 30

Gly Gly Arg Ser Ile Ser Gly Glu Pro Ile Asn Thr Ile Ala Glu Lys
35 40 45

Val Pro Leu Pro Pro Leu Cys Asn Pro Thr Thr Pro Lys Gly Ser Cys
50 55 60

Ile Lys Pro Asn Lys Ala Pro Val Pro Lys Val Lys Glu Ile Glu Ser
65 70 75 80

Ile Tyr Pro Lys Leu Pro Thr Ala Pro Val Ala Thr Asp Thr Tyr Thr
85 90 95

Ser Thr Ser Thr Glu Ser Ala Lys Lys Ser Lys Lys Val Lys Phe Asp
100 105 110

Asn Pro Lys Val Gly Lys Tyr Thr Lys Leu Glu Glu Glu Gly Leu Glu
115 120 125

Leu Leu Ser Asp Pro Glu Glu Asp Asn Asp Glu Lys Ser Ser Ile Leu
130 135 140

Thr Phe Glu Glu Lys Asp Thr Ala Ser Thr Ser Ile Glu Ala Arg Leu
 145 150 155 160

Glu Ala Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Met Leu Lys Thr
 165 170 175

Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
 180 185 190

Asp Ala Met Ile Gly Met Arg Glu Glu Leu Ile Asn Ser Ile Met Thr
 195 200 205

Glu Ala Lys Asp Lys Ile Ala Glu Met Met Lys Glu Glu Asp Thr Gln
 210 215 220

Arg Ala Lys Ile Gly Asp Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
 225 230 235 240

Glu Leu Asn Lys Ile Leu Glu Asp Gln Ser Ser Ser Gly Glu Ser Glu
 245 250 255

Ser Glu Glu Glu Ser Gly Glu Ser Glu Ser Asp Glu Glu Glu Ser Asp
 260 265 270

Ile Tyr Asn Leu Asp Leu
 275

<210> 10
 <211> 294
 <212> PRT
 <213> Avian pneumovirus strain C

<400> 10

Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Leu Met Gly Asn Glu Ala
 1 5 10 15

Ala Lys Ala Ala Glu Ala Phe Gln Arg Ser Leu Lys Lys Ile Gly His
 20 25 30

Arg Arg Thr Gln Ser Ile Val Gly Asp Lys Ile Ile Thr Val Ser Glu
 35 40 45

Thr Val Glu Lys Pro Thr Ile Ser Lys Ser Thr Lys Val Thr Thr Pro
 50 55 60

Pro Glu Arg Lys Asn Ala Trp Gly Glu Lys Pro Asp Thr Thr Arg Ser
 65 70 75 80

Gln Thr Glu Glu Ala Arg Asn Glu Ala Thr Pro Glu Asp Ala Ser Arg
85 90 95

Leu Tyr Glu Glu Val Phe Ala Pro Thr Ser Asp Gly Lys Thr Pro Ala
100 105 110

Glu Lys Gly Lys Glu Thr Pro Glu Lys Pro Lys Lys Lys Val Thr Phe
115 120 125

Lys Asn Asp Glu Ser Gly Arg Tyr Thr Lys Leu Glu Met Glu Ala Leu
130 135 140

Glu Leu Leu Ser Asp Asn Glu Asp Asp Asp Ala Glu Ser Ser Val Leu
145 150 155 160

Thr Phe Glu Glu Lys Asp Thr Ser Ala Leu Ser Leu Glu Ala Arg Leu
165 170 175

Glu Ser Ile Asp Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr
180 185 190

Leu Asn Val Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
195 200 205

Asp Ala Met Val Gly Leu Arg Glu Glu Leu Ile Ala Asp Ile Ile Lys
210 215 220

Glu Ala Lys Gly Lys Ala Ala Glu Met Met Lys Glu Glu Ala Lys Gln
225 230 235 240

Lys Ser Lys Ile Gly Asn Gly Ser Val Gly Leu Thr Glu Lys Ala Lys
245 250 255

Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
260 265 270

Glu Glu Glu Glu Glu Glu Asp Glu Glu Glu Ser Asn Pro Asp Asp Asp
275 280 285

Leu Tyr Ser Leu Thr Met
290

<210> 11
<211> 241
<212> PRT

<213> Bovine respiratory syncytial virus

<400> 11

Met Glu Lys Phe Ala Pro Glu Phe His Gly Glu Asp Ala Asn Thr Lys
1 5 10 15

Ala Thr Lys Phe Leu Glu Ser Leu Lys Gly Lys Phe Thr Ser Ser Lys
20 25 30

Asp Ser Arg Lys Lys Asp Ser Ile Ile Ser Val Asn Ser Val Asp Ile
35 40 45

Glu Leu Pro Lys Glu Ser Pro Ile Thr Ser Thr Asn Gln Asn Ile Asn
50 55 60

Gln Pro Ser Glu Ile Asn Asp Thr Ile Ala Thr Asn Gln Val His Ile
65 70 75 80

Arg Lys Pro Leu Val Ser Phe Lys Glu Glu Leu Pro Ser Ser Glu Asn
85 90 95

Pro Phe Thr Arg Leu Tyr Lys Glu Thr Ile Glu Thr Phe Asp Asn Asn
100 105 110

Glu Glu Glu Ser Ser Tyr Ser Tyr Asp Glu Ile Asn Asp Gln Thr Asn
115 120 125

Asp Asn Ile Thr Ala Arg Leu Asp Arg Ile Asp Glu Lys Leu Ser Glu
130 135 140

Ile Ile Gly Met Leu His Thr Leu Val Val Ala Ser Ala Gly Pro Thr
145 150 155 160

Ala Ala Arg Asp Gly Ile Arg Asp Ala Met Val Gly Leu Arg Glu Glu
165 170 175

Met Ile Glu Lys Ile Arg Ser Glu Ala Leu Met Thr Asn Asp Arg Leu
180 185 190

Glu Ala Met Ala Arg Leu Arg Asp Glu Glu Ser Glu Lys Met Thr Lys
195 200 205

Asp Thr Ser Asp Glu Val Lys Leu Thr Pro Thr Ser Glu Lys Leu Asn
210 215 220

Met Val Leu Glu Asp Glu Ser Ser Asp Asn Asp Leu Ser Leu Glu Asp
 225 230 235 240

Phe

<210> 12
 <211> 241
 <212> PRT
 <213> Human respiratory syncytial virus

<400> 12

Met Glu Lys Phe Ala Pro Glu Phe His Gly Glu Asp Ala Asn Asn Lys
 1 5 10 15

Ala Thr Lys Phe Leu Glu Ser Ile Lys Gly Lys Phe Ala Ser Ser Lys
 20 25 30

Asp Pro Lys Lys Lys Asp Ser Ile Ile Ser Val Asn Ser Ile Asp Ile
 35 40 45

Glu Val Thr Lys Glu Ser Pro Ile Thr Ser Gly Thr Asn Ile Ile Asn
 50 55 60

Pro Thr Ser Glu Ala Asp Ser Thr Pro Glu Thr Lys Ala Asn Tyr Pro
 65 70 75 80

Arg Lys Pro Leu Val Ser Phe Lys Glu Asp Leu Thr Pro Ser Asp Asn
 85 90 95

Pro Phe Ser Lys Leu Tyr Lys Glu Thr Ile Glu Thr Phe Asp Asn Asn
 100 105 110

Glu Glu Glu Ser Ser Tyr Ser Tyr Glu Glu Ile Asn Asp Gln Thr Asn
 115 120 125

Asp Asn Ile Thr Ala Arg Leu Asp Arg Ile Asp Glu Lys Leu Ser Glu
 130 135 140

Ile Leu Gly Met Leu His Thr Leu Val Val Ala Ser Ala Gly Pro Thr
 145 150 155 160

Ser Ala Arg Asp Gly Ile Arg Asp Ala Met Val Gly Leu Arg Glu Glu
 165 170 175

Met Ile Glu Lys Ile Arg Ala Glu Ala Leu Met Thr Asn Asp Arg Leu
 180 185 190

Glu Ala Met Ala Arg Leu Arg Asn Glu Glu Ser Glu Lys Met Ala Lys
 195 200 205

Asp Thr Ser Asp Glu Val Pro Leu Asn Pro Thr Ser Lys Lys Leu Ser
 210 215 220

Asp Leu Leu Glu Asp Asn Asp Ser Asp Asn Asp Leu Ser Leu Asp Asp
 225 230 235 240

Phe

<210> 13
 <211> 295
 <212> PRT
 <213> Pneumonia virus of mice

<400> 13

Met Glu Lys Phe Ala Pro Glu Phe Val Gly Glu Asp Ala Asn Lys Lys
 1 5 10 15

Ala Glu Glu Phe Leu Lys His Arg Ser Phe Pro Ser Glu Lys Pro Leu
 20 25 30

Ala Gly Ile Pro Asn Thr Ala Thr His Val Thr Lys Tyr Asn Met Pro
 35 40 45

Pro Ile Leu Arg Ser Ser Phe Lys Leu Pro Ser Pro Arg Val Ala Ala
 50 55 60

Asn Leu Thr Glu Pro Ser Ala Pro Pro Thr Thr Pro Pro Pro Thr Pro
 65 70 75 80

Pro Gln Asn Lys Glu Glu Gln Pro Lys Glu Ser Asp Val Asp Ile Glu
 85 90 95

Thr Met His Val Cys Lys Val Pro Asp Asn Pro Glu His Ser Lys Lys
 100 105 110

Pro Cys Cys Ser Asp Asp Thr Asp Thr Lys Lys Thr Arg Lys Pro Met
 115 120 125

Val Thr Phe Val Glu Pro Glu Glu Lys Phe Val Gly Leu Gly Ala Ser
 130 135 140

Leu Tyr Arg Glu Thr Met Gln Thr Phe Ala Ala Asp Gly Tyr Asp Glu
145 150 155 160

Glu Ser Asn Leu Ser Phe Glu Glu Thr Asn Gln Glu Pro Gly Ser Ser
165 170 175

Ser Val Glu Gln Arg Leu Asp Arg Ile Glu Glu Lys Leu Ser Tyr Ile
180 185 190

Ile Gly Leu Leu Asn Thr Ile Met Val Ala Thr Ala Gly Pro Thr Thr
195 200 205

Ala Arg Asp Glu Ile Arg Asp Ala Leu Ile Gly Thr Arg Glu Glu Leu
210 215 220

Ile Glu Met Ile Lys Ser Asp Ile Leu Thr Val Asn Asp Arg Ile Val
225 230 235 240

Ala Met Glu Lys Leu Arg Asp Glu Glu Cys Ser Arg Ala Asp Thr Asp
245 250 255

Asp Gly Ser Ala Cys Tyr Leu Thr Asp Arg Ala Arg Ile Leu Asp Lys
260 265 270

Ile Val Ser Ser Asn Ala Glu Glu Ala Lys Glu Asp Leu Asp Val Asp
275 280 285

Asp Ile Met Gly Ile Asn Phe
290 295

<210> 14
<211> 254
<212> PRT
<213> Human metapneumovirus 00-1

<400> 14

Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
1 5 10 15

Ala Val Gln Val Asp Leu Ile Glu Lys Asp Leu Leu Pro Ala Ser Leu
20 25 30

Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
35 40 45

Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60

Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80

Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95

Asp Glu Tyr Ser Lys Leu Glu Phe Asp Lys Leu Thr Val Cys Glu Val
 100 105 110

Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125

Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140

Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Thr Pro Val Thr Ile
 145 150 155 160

Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175

Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190

Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205

Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220

Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Lys Ile Cys Lys
 225 230 235 240

Thr Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
 245 250

<210> 15
 <211> 254
 <212> PRT
 <213> Turkey rhinotracheitis virus B
 <400> 15

Met Glu Ser Tyr Ile Ile Asp Thr Tyr Gln Gly Val Pro Tyr Thr Ala
 1 5 10 15

Ala Val Gln Val Asp Leu Val Glu Lys Asp Asn Asn Pro Ala Lys Leu
 20 25 30

Thr Val Trp Phe Pro Leu Phe Gln Ser Ser Thr Pro Ala Pro Val Leu
 35 40 45

Leu Asp Gln Leu Lys Thr Leu Ser Ile Thr Thr Gln Tyr Thr Val Ser
 50 55 60

Pro Glu Gly Pro Val Leu Gln Val Asn Ala Thr Ala Gln Gly Ala Ala
 65 70 75 80

Met Ser Ala Leu Pro Lys Lys Phe Ser Val Ser Ala Ala Ala Ala Leu
 85 90 95

Asp Glu Tyr Ser Lys Leu Asp Phe Gly Val Leu Thr Val Cys Asp Val
 100 105 110

Arg Ala Val Tyr Leu Thr Thr Leu Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125

Ile Val Thr Asn Met Asn Thr Val Gly Arg Lys Thr His Asp Leu Ile
 130 135 140

Ala Leu Cys Asp Phe Ile Asp Met Glu Arg Gly Ile Pro Val Thr Ile
 145 150 155 160

Pro Ala Tyr Ile Lys Ala Val Ser Ile Lys Asp Ser Glu Ser Ala Thr
 165 170 175

Val Glu Ala Ala Ile Ser Gly Glu Ala Asp Gln Ala Ile Thr Gln Ala
 180 185 190

Arg Ile Ala Pro Tyr Ala Gly Leu Ile Leu Leu Met Ala Met Asn Asn
 195 200 205

Pro Lys Gly Ile Phe Arg Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220

Glu Leu Gly Pro Tyr Val Gln Ala Glu Ser Leu Gly Lys Ile Cys Lys
 225 230 235 240

Thr Trp Asn His Gln Arg Thr Arg Tyr Ile Leu Lys Ser Arg
 245 250

<210> 16
 <211> 254
 <212> PRT
 <213> Turkey rhinotracheitis virus A

<400> 16

Met Glu Ser Tyr Ile Ile Asp Thr Tyr Gln Gly Val Pro Tyr Thr Ala
 1 5 10 15

Ala Val Gln Val Asp Leu Ile Glu Lys Asp Ser Asn Pro Ala Thr Leu
 20 25 30

Thr Val Trp Phe Pro Leu Phe Gln Ser Ser Thr Pro Ala Pro Val Leu
 35 40 45

Leu Asp Gln Leu Lys Thr Leu Ser Ile Thr Thr Gln Tyr Thr Ala Ser
 50 55 60

Pro Glu Gly Pro Val Leu Gln Val Asn Ala Ala Ala Gln Gly Ala Ala
 65 70 75 80

Met Ser Ala Leu Pro Lys Lys Phe Ala Val Ser Ala Ala Val Ala Leu
 85 90 95

Asp Glu Tyr Ser Arg Leu Glu Phe Gly Thr Leu Thr Val Cys Asp Val
 100 105 110

Arg Ser Ile Tyr Leu Thr Thr Leu Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125

Ile Met Thr Asp Val Arg Ser Val Gly Arg Lys Thr His Asp Leu Ile
 130 135 140

Ala Leu Cys Asp Phe Ile Asp Ile Glu Lys Gly Val Pro Ile Thr Ile
 145 150 155 160

Pro Ala Tyr Ile Lys Ala Val Ser Ile Lys Asp Ser Glu Ser Ala Thr
 165 170 175

Val Glu Ala Ala Ile Ser Gly Glu Ala Asp Gln Ala Ile Thr Gln Ala
 180 185 190

Arg Ile Ala Pro Tyr Ala Gly Leu Ile Leu Ile Met Thr Met Asn Asn
 195 200 205

Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Met Gln Val Ile Val
 210 215 220

Glu Leu Gly Pro Tyr Val Gln Ala Glu Ser Leu Gly Lys Ile Cys Lys
 225 230 235 240

Thr Trp Asn His Gln Arg Thr Arg Tyr Val Leu Arg Ser Arg
 245 250

<210> 17
 <211> 254
 <212> PRT
 <213> Avian pneumovirus C

<400> 17

Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Val Pro Tyr Thr Ala
 1 5 10 15

Ala Val Gln Thr Asp Leu Val Glu Lys Asp Gln Leu Pro Ala Arg Leu
 20 25 30

Thr Val Trp Val Pro Leu Phe Gln Thr Asn Thr Pro Pro Thr Val Leu
 35 40 45

Leu Glu Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Thr Ala Ser
 50 55 60

Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80

Met Ser Ala Leu Pro Lys Ser Phe Asp Val Ser Ala Ser Val Ala Leu
 85 90 95

Asp Asp Tyr Ser Lys Leu Glu Phe Asp Lys Leu Thr Val Cys Glu Leu
 100 105 110

Lys Ala Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125

Phe Val Asn Ser Ala Lys Ala Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140

Ala Leu Cys Asp Phe Leu Asp Leu Glu Lys Gly Val Pro Val Thr Ile
 145 150 155 160

Pro Ala Tyr Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175

Val Glu Ala Ala Ile Ser Gly Glu Ala Asp Gln Ala Ile Thr Gln Ala
180 185 190

Arg Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
195 200 205

Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Val Gln Val Ile Val
210 215 220

Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Arg Ile Cys Arg
225 230 235 240

Asn Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
245 250

<210> 18
<211> 256
<212> PRT
<213> Bovine respiratory syncytial virus

<400> 18

Met Glu Thr Tyr Val Asn Lys Leu His Glu Gly Ser Thr Tyr Thr Ala
1 5 10 15

Ala Val Gln Tyr Asn Val Ile Glu Lys Asp Asp Asp Pro Ala Ser Leu
20 25 30

Thr Ile Trp Val Pro Met Phe Gln Ser Ser Ile Ser Ala Asp Leu Leu
35 40 45

Ile Lys Glu Leu Ile Asn Val Asn Ile Leu Val Arg Gln Ile Ser Thr
50 55 60

Leu Lys Gly Pro Ser Leu Lys Ile Met Ile Asn Ser Arg Ser Ala Val
65 70 75 80

Leu Ala Gln Met Pro Ser Lys Phe Thr Ile Ser Ala Asn Val Ser Leu
85 90 95

Asp Glu Arg Ser Lys Leu Ala Tyr Asp Ile Thr Thr Pro Cys Glu Ile
100 105 110

Lys Ala Cys Ser Leu Thr Cys Leu Lys Val Lys Asn Met Leu Thr Thr
115 120 125

Val Lys Asp Leu Thr Met Lys Thr Phe Asn Pro Thr His Glu Ile Ile
 130 135 140

Ala Leu Cys Glu Phe Glu Asn Ile Met Thr Ser Lys Arg Val Val Ile
 145 150 155 160

Pro Thr Phe Leu Arg Ser Ile Asn Val Lys Ala Lys Asp Leu Asp Ser
 165 170 175

Leu Glu Asn Ile Ala Thr Thr Glu Phe Lys Asn Ala Ile Thr Asn Ala
 180 185 190

Lys Ile Ile Pro Tyr Ala Gly Leu Val Leu Val Ile Thr Val Thr Asp
 195 200 205

Asn Lys Gly Ala Phe Lys Tyr Ile Lys Pro Gln Ser Gln Phe Ile Val
 210 215 220

Asp Leu Gly Ala Tyr Leu Glu Lys Glu Ser Ile Tyr Tyr Val Thr Thr
 225 230 235 240

Asn Trp Lys His Thr Ala Thr Lys Phe Ser Ile Lys Pro Ile Glu Asp
 245 250 255

<210> 19
 <211> 256
 <212> PRT
 <213> Human respiratory syncytial virus
 <400> 19

Met Glu Thr Tyr Val Asn Lys Leu His Glu Gly Ser Thr Tyr Thr Ala
 1 5 10 15

Ala Val Gln Tyr Asn Val Leu Glu Lys Asp Asp Asp Pro Ala Ser Leu
 20 25 30

Thr Ile Trp Val Pro Met Phe Gln Ser Ser Val Pro Ala Asp Leu Leu
 35 40 45

Ile Lys Glu Leu Ala Ser Ile Asn Ile Leu Val Lys Gln Ile Ser Thr
 50 55 60

Pro Lys Gly Pro Ser Leu Arg Val Thr Ile Asn Ser Arg Ser Ala Val
 65 70 75 80

Leu Ala Gln Met Pro Ser Asn Phe Ile Ile Ser Ala Asn Val Ser Leu
 85 90 95

Asp Glu Arg Ser Lys Leu Ala Tyr Asp Val Thr Thr Pro Cys Glu Ile
 100 105 110

Lys Ala Cys Ser Leu Thr Cys Leu Lys Val Lys Ser Met Leu Thr Thr
 115 120 125

Val Lys Asp Leu Thr Met Lys Thr Phe Asn Pro Thr His Glu Ile Ile
 130 135 140

Ala Leu Cys Glu Phe Glu Asn Ile Met Thr Ser Lys Arg Val Ile Ile
 145 150 155 160

Pro Thr Tyr Leu Arg Pro Ile Ser Val Lys Asn Lys Asp Leu Asn Ser
 165 170 175

Leu Glu Asn Ile Ala Thr Thr Glu Phe Lys Asn Ala Ile Thr Asn Ala
 180 185 190

Lys Ile Ile Pro Tyr Ala Gly Leu Val Leu Val Ile Thr Val Thr Asp
 195 200 205

Asn Lys Gly Ala Phe Lys Tyr Ile Lys Pro Gln Ser Gln Phe Ile Val
 210 215 220

Asp Leu Gly Ala Tyr Leu Glu Lys Glu Ser Ile Tyr Tyr Val Thr Thr
 225 230 235 240

Asn Trp Lys His Thr Ala Thr Arg Phe Ser Ile Lys Pro Leu Glu Asp
 245 250 255

<210> 20
 <211> 257
 <212> PRT
 <213> Pneumonia virus of mice

<400> 20

Met Glu Ala Tyr Leu Val Glu Met Tyr His Gly Val Pro Tyr Thr Ala
 1 5 10 15

Ala Val Gln Leu Asn Leu Val Glu Lys His Ser Ala Asn Ile Ser Leu
 20 25 30

Thr Val Trp Ile Pro Met Phe Gln Thr Ser Leu Pro Lys Asn Ser Val
 35 40 45

Met Asp Leu Leu His Asp Val Thr Val Ile Cys Thr Gln Ile Ser Thr
 50 55 60

Val His Gly Pro Met Ile Lys Val Asp Leu Ser Ser Ser Asn Ala Gly
 65 70 75 80

Leu Ala Thr Met Pro Arg Gln Phe Leu Ile Asn Ala Ile Ile Ala Leu
 85 90 95

Asp Asp Trp Gly Asn Met Asp Tyr Glu Val Pro Val Ala Phe Asp Lys
 100 105 110

Lys Ser Phe Cys Val Thr Ile Leu Lys Pro Lys Asn Met Leu Tyr Thr
 115 120 125

Val Pro Ser Ile Thr Pro Thr Asn Arg Pro Thr His Glu Leu Ile Ala
 130 135 140

Val Cys Ser Phe His Asn Arg Val Thr Leu Lys Ser Phe Asn Ile Pro
 145 150 155 160

Val Phe Ile Arg Ala Leu Tyr Ile Arg Gln Gln Gly Leu Asp Ser Val
 165 170 175

Glu Gln Ala Ile Ser Ser Asp Val Asp His Ala Ile Thr Thr Ala Arg
 180 185 190

Val Ala Pro Tyr Ala Gly Leu Thr Leu Val Ile Asn Ile Thr Ser Thr
 195 200 205

Lys Gly Ala Phe Lys Leu Leu Lys Ala Gly Ser Gln Ile Leu Ala Glu
 210 215 220

Leu Gly Pro Tyr Leu Thr Gln Val Ser Leu His Asp Val Ile Met Asn
 225 230 235 240

Trp Lys His Thr Gly Thr Ser Tyr Ile Leu Lys Ser Ser Ser Thr Ser
 245 250 255

Gly

<210> 21
 <211> 539
 <212> PRT
 <213> Human metapneumovirus 00-1

<400> 21

Met Ser Trp Lys Val Val Ile Ile Phe Ser Leu Leu Ile Thr Pro Gln
1 5 10 15

His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
20 25 30

Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
35 40 45

Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Ala Asp Gly Pro
50 55 60

Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
65 70 75 80

Leu Arg Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
85 90 95

Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
115 120 125

Arg Leu Glu Ser Glu Val Thr Ala Ile Lys Asn Ala Leu Lys Lys Thr
130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145 150 155 160

Ala Val Arg Glu Leu Lys Asp Phe Val Ser Lys Asn Leu Thr Arg Ala
165 170 175

Ile Asn Lys Asn Lys Cys Asp Ile Ala Asp Leu Lys Met Ala Val Ser
180 185 190

Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195 200 205

Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
210 215 220

Ala Glu Leu Ala Arg Ala Val Ser Asn Met Pro Thr Ser Ala Gly Gln
225 230 235 240

Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245 250 255

Gly Phe Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln
260 265 270

Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala
275 280 285

Ala Pro Ser Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg
290 295 300

Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
305 310 315 320

Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp
325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile
340 345 350

Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His
355 360 365

Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
370 375 380

Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile
385 390 395 400

Lys Gln Leu Asn Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp
405 410 415

Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
420 425 430

Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro
435 440 445

Val Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450 455 460

Glu Ser Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Arg Ile
465 470 475 480

Leu Ser Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Ile Ile
485 490 495

Leu Ile Ala Val Leu Gly Ser Thr Met Ile Leu Val Ser Val Phe Ile
500 505 510

Ile Ile Lys Lys Thr Lys Lys Pro Thr Gly Ala Pro Pro Glu Leu Ser
515 520 525

Gly Val Thr Asn Asn Gly Phe Ile Pro His Asn
530 535

<210> 22
<211> 538
<212> PRT
<213> Turkey rhinotracheitis virus A

<400> 22

Met Asp Val Arg Ile Cys Leu Leu Leu Phe Leu Ile Ser Asn Pro Ser
1 5 10 15

Ser Cys Ile Gln Glu Thr Tyr Asn Glu Glu Ser Cys Ser Thr Val Thr
20 25 30

Arg Gly Tyr Lys Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
35 40 45

Asn Leu Glu Ile Gly Asn Val Glu Asn Ile Thr Cys Asn Asp Gly Pro
50 55 60

Ser Leu Ile Asp Thr Glu Leu Val Leu Thr Lys Asn Ala Leu Arg Glu
65 70 75 80

Leu Lys Thr Val Ser Ala Asp Gln Val Ala Lys Glu Ser Arg Leu Ser
85 90 95

Ser Pro Arg Arg Arg Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Leu Ala Lys Thr Ile
115 120 125

Arg Leu Glu Gly Glu Val Lys Ala Ile Lys Asn Ala Leu Arg Asn Thr
130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160

Ala Val Asn Asp Leu Lys Glu Phe Ile Ser Lys Lys Leu Thr Pro Ala
 165 170 175

Ile Asn Gln Asn Lys Cys Asn Ile Ala Asp Ile Lys Met Ala Ile Ser
 180 185 190

Phe Gly Gln Asn Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
 195 200 205

Asp Ser Ala Gly Ile Thr Ser Ala Val Ser Leu Asp Leu Met Thr Asp
 210 215 220

Asp Glu Leu Val Arg Ala Ile Asn Arg Met Pro Thr Ser Ser Gly Gln
 225 230 235 240

Ile Ser Leu Met Leu Asn Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255

Gly Ile Leu Ile Gly Val Tyr Asp Gly Thr Val Val Tyr Met Val Gln
 260 265 270

Leu Pro Ile Phe Gly Val Ile Glu Thr Pro Cys Trp Arg Val Val Ala
 275 280 285

Ala Pro Leu Cys Arg Lys Glu Lys Gly Asn Tyr Ala Cys Ile Leu Arg
 290 295 300

Glu Asp Gln Gly Trp Tyr Cys Thr Asn Ala Gly Ser Thr Ala Tyr Tyr
 305 310 315 320

Pro Asn Lys Asp Asp Cys Glu Val Arg Asp Asp Tyr Val Phe Cys Asp
 325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Leu Glu Val Glu Gln Cys Asn Tyr
 340 345 350

Asn Ile Ser Thr Ser Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365

Pro Val Ser Met Val Ala Leu Thr Pro Leu Gly Gly Leu Val Ser Cys
 370 375 380

Tyr Glu Ser Val Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
 385 390 395 400

Lys Gln Leu Gly Lys Gly Cys Thr His Ile Pro Asn Asn Glu Ala Asp
 405 410 415

Thr Ile Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Val Gly
 420 425 430

Glu Gln Arg Thr Ile Lys Gly Ala Pro Val Val Asn Asn Phe Asn Pro
 435 440 445

Ile Leu Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
 450 455 460

Glu Ser Ile Asp Arg Ser Gln Asp Leu Ile Asp Lys Ser Asn Asp Leu
 465 470 475 480

Leu Gly Ala Asp Ala Lys Ser Lys Ala Gly Ile Ala Ile Ala Ile Val
 485 490 495

Val Leu Val Ile Leu Gly Ile Phe Phe Leu Leu Ala Val Ile Tyr Tyr
 500 505 510

Cys Ser Arg Val Arg Lys Thr Lys Pro Lys His Asp Tyr Pro Ala Thr
 515 520 525

Thr Gly His Ser Ser Met Ala Tyr Val Ser
 530 535

<210> 23
 <211> 542
 <212> PRT
 <213> Avian pneumovirus B

<400> 23

Gly Ala Ser Lys Met Tyr Leu Lys Leu Leu Leu Ile Ile Tyr Leu Val
 1 5 10 15

Val Gly Ala Ser Gly Lys Ile Gln Glu Thr Tyr Ser Glu Glu Ser Cys
 20 25 30

Ser Thr Val Thr Arg Gly Tyr Lys Ser Val Leu Arg Thr Gly Trp Tyr
 35 40 45

Thr Asn Val Phe Asn Leu Glu Ile Gly Asn Val Glu Asn Ile Thr Cys
 50 55 60

Asn Asp Gly Pro Ser Leu Ile Ser Thr Glu Leu Ser Leu Thr Gln Asn
65 70 75 80

Ala Leu Gln Glu Leu Arg Thr Val Ser Ala Asp Gln Ile Thr Lys Glu
85 90 95

Asn Arg Ile Leu Ser His Arg Lys Lys Arg Phe Val Leu Gly Ala Ile
100 105 110

Ala Leu Gly Val Ala Thr Thr Ala Ala Val Thr Ala Gly Val Ala Leu
115 120 125

Ala Lys Thr Ile Arg Leu Glu Gly Glu Val Lys Ala Ile Lys Leu Ala
130 135 140

Leu Arg Ser Thr Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg
145 150 155 160

Ile Leu Ala Thr Ala Val Asn Asp Leu Lys Glu Phe Ile Ser Lys Lys
165 170 175

Leu Thr Pro Ala Ile Asn Gln Asn Lys Cys Asn Ile Ala Asp Ile Arg
180 185 190

Met Ala Ile Ser Phe Gly Gln Asn Asn Arg Arg Phe Leu Asn Val Val
195 200 205

Arg Gln Phe Ser Asp Ser Ala Gly Ile Thr Ser Ala Val Ser Leu Asp
210 215 220

Leu Met Thr Asp Ala Glu Leu Val Lys Ala Ile Asn Arg Met Pro Thr
225 230 235 240

Ser Ser Gly Gln Ile Ser Leu Met Leu Asn Asn Arg Ala Met Val Arg
245 250 255

Arg Lys Gly Phe Gly Ile Leu Ile Gly Val Tyr Gly Gly Thr Val Val
260 265 270

Tyr Met Val Gln Leu Pro Ile Phe Gly Val Ile Glu Thr Pro Cys Trp
275 280 285

Arg Val Val Ala Ala Pro Leu Cys Arg His Glu Arg Glu Ser Tyr Ala
290 295 300

Cys Leu Leu Arg Glu Asp Gln Gly Trp Tyr Cys Thr Asn Ala Gly Ser
 305 310 315 320

Thr Ala Tyr Tyr Pro Asn Glu Asp Asp Cys Glu Val Arg Asp Asp Tyr
 325 330 335

Val Phe Cys Asp Thr Ala Ala Gly Ile Asn Val Ala Ser Glu Val Glu
 340 345 350

Gln Cys Asn His Asn Ile Ser Thr Ser Thr Tyr Pro Cys Lys Val Ser
 355 360 365

Thr Gly Arg His Pro Val Ser Met Val Ala Leu Thr Pro Leu Gly Gly
 370 375 380

Leu Val Ser Cys Tyr Glu Gly Val Ser Cys Ser Ile Gly Ser Asn Lys
 385 390 395 400

Val Gly Ile Ile Lys Gln Leu Asn Lys Gly Cys Thr His Ile Pro Asn
 405 410 415

Asn Glu Ala Asp Thr Ile Thr Ile Asp Asn Thr Ile Tyr Gln Leu Ser
 420 425 430

Lys Val Val Gly Glu Gln Arg Thr Ile Lys Gly Ala Pro Val Val Asn
 435 440 445

Asn Phe Asn Pro Leu Leu Phe Pro Glu Asp Gln Phe Asn Val Ala Leu
 450 455 460

Asp Gln Val Phe Glu Ser Val Asp Lys Ser Lys Asp Leu Ile Asp Lys
 465 470 475 480

Ser Asn Asp Leu Leu Asp Ile Glu Val Lys Ser Asn Ile Gly Ala Ala
 485 490 495

Leu Ala Ile Thr Ile Leu Val Val Leu Ser Met Leu Ile Ile Val Gly
 500 505 510

Ile Ala Tyr Tyr Val Val Lys Lys Arg Lys Ala Lys Thr Ser Asn Gly
 515 520 525

Tyr Pro Lys Thr Thr Gly Gln Ser Asn Met Gly Tyr Ile Ser
 530 535 540

<210> 24
 <211> 537
 <212> PRT
 <213> Avian pneumovirus C

<400> 24

Met Ser Trp Lys Val Val Leu Leu Leu Val Leu Leu Ala Thr Pro Thr
 1 5 10 15

Gly Gly Leu Glu Glu Ser Tyr Leu Glu Glu Ser Tyr Ser Thr Val Thr
 20 25 30

Arg Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45

Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
 50 55 60

Ser Leu Ile Arg Thr Glu Leu Glu Leu Thr Lys Asn Ala Leu Glu Glu
 65 70 75 80

Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Lys Glu Ala Arg Ile Met
 85 90 95

Ser Pro Arg Lys Ala Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
 115 120 125

Arg Leu Glu Gly Glu Val Ala Ala Ile Lys Gly Ala Leu Arg Lys Thr
 130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160

Ala Val Asn Asp Leu Lys Asp Phe Ile Ser Lys Lys Leu Thr Pro Ala
 165 170 175

Ile Asn Arg Asn Lys Cys Asp Ile Ser Asp Leu Lys Met Ala Val Ser
 180 185 190

Phe Gly Gln Tyr Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
 195 200 205

Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
 210 215 220

Ala Glu Leu Val Arg Ala Val Ser Asn Met Pro Thr Ser Ser Gly Gln
 225 230 235 240

Ile Asn Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255

Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Val Tyr Ile Val Gln
 260 265 270

Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Lys Val Lys Ala
 275 280 285

Ala Pro Leu Cys Ser Gly Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg
 290 295 300

Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
 305 310 315 320

Pro Asn Glu Glu Asp Cys Glu Val Arg Ser Asp His Val Phe Cys Asp
 325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Lys Glu Ser Glu Glu Cys Asn Arg
 340 345 350

Asn Ile Ser Thr Thr Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365

Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
 370 375 380

Tyr Asp Gly Met Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
 385 390 395 400

Arg Pro Leu Gly Lys Gly Cys Ser Tyr Ile Ser Asn Gln Asp Ala Asp
 405 410 415

Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
 420 425 430

Glu Gln His Thr Ile Lys Gly Lys Pro Val Ser Ser Asn Phe Asp Pro
 435 440 445

Ile Glu Phe Pro Glu Asp Gln Phe Asn Ile Ala Leu Asp Gln Val Phe
 450 455 460

Glu Ser Val Glu Lys Ser Gln Asn Leu Ile Asp Gln Ser Asn Lys Ile
 465 470 475 480

Leu Asp Ser Ile Glu Lys Gly Asn Ala Gly Phe Val Ile Val Ile Val
 485 490 495

Leu Ile Val Leu Leu Met Leu Ala Ala Val Gly Val Gly Val Phe Phe
 500 505 510

Val Val Lys Lys Arg Lys Ala Ala Pro Lys Phe Pro Met Glu Met Asn
 515 520 525

Gly Val Asn Asn Lys Gly Phe Ile Pro
 530 535

<210> 25
 <211> 574
 <212> PRT
 <213> Bovine respiratory syncytial virus

<400> 25

Met Ala Thr Thr Ala Met Arg Met Ile Ile Ser Ile Ile Phe Ile Ser
 1 5 10 15

Thr Tyr Val Thr His Ile Thr Leu Cys Gln Asn Ile Thr Glu Glu Phe
 20 25 30

Tyr Gln Ser Thr Cys Ser Ala Val Ser Arg Gly Tyr Leu Ser Ala Leu
 35 40 45

Arg Thr Gly Trp Tyr Thr Ser Val Val Thr Ile Glu Leu Ser Lys Ile
 50 55 60

Gln Lys Asn Val Cys Lys Ser Thr Asp Ser Lys Val Lys Leu Ile Lys
 65 70 75 80

Gln Glu Leu Glu Arg Tyr Asn Asn Ala Val Val Glu Leu Gln Ser Leu
 85 90 95

Met Gln Asn Glu Pro Ala Ser Phe Ser Arg Ala Lys Arg Gly Ile Pro
 100 105 110

Glu Leu Ile His Tyr Thr Arg Asn Ser Thr Lys Lys Phe Tyr Gly Leu
 115 120 125

Met Gly Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Ile
 130 135 140

Gly Ser Ala Val Ala Ser Gly Val Ala Val Ser Lys Val Leu His Leu
 145 150 155 160

Glu Gly Glu Val Asn Lys Ile Lys Asn Ala Leu Leu Ser Thr Asn Lys
 165 170 175

Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
 180 185 190

Leu Asp Leu Lys Asn Tyr Ile Asp Lys Glu Leu Leu Pro Gln Val Asn
 195 200 205

Asn His Asp Cys Arg Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
 210 215 220

Gln Lys Asn Asn Arg Leu Leu Glu Ile Ala Arg Glu Phe Ser Val Asn
 225 230 235 240

Ala Gly Ile Thr Thr Pro Leu Ser Thr Tyr Met Leu Thr Asn Ser Glu
 245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
 260 265 270

Leu Met Ser Ser Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
 275 280 285

Met Ser Val Val Lys Glu Glu Val Ile Ala Tyr Val Val Gln Leu Pro
 290 295 300

Ile Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
 305 310 315 320

Leu Cys Thr Thr Asp Asn Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
 325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
 340 345 350

Pro Gln Thr Glu Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
 355 360 365

Thr Met Asn Ser Leu Thr Leu Pro Thr Asp Val Asn Leu Cys Asn Thr
 370 375 380

Asp Ile Phe Asn Thr Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
 385 390 395 400

Asp Ile Ser Ser Ser Val Ile Thr Ser Ile Gly Ala Ile Val Ser Cys
 405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile
 420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp
 435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Leu Glu Gly
 450 455 460

Lys Ala Leu Tyr Ile Lys Gly Glu Pro Ile Ile Asn Tyr Tyr Asp Pro
 465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ala Gln Val Asn
 485 490 495

Ala Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Arg Ser Asp Glu Leu
 500 505 510

Leu His Ser Val Asp Val Gly Lys Ser Thr Thr Asn Val Val Ile Thr
 515 520 525

Thr Ile Ile Ile Val Ile Val Val Val Ile Leu Met Leu Ile Ala Val
 530 535 540

Gly Leu Leu Phe Tyr Cys Lys Thr Lys Ser Thr Pro Ile Met Leu Gly
 545 550 555 560

Lys Asp Gln Leu Ser Gly Ile Asn Asn Leu Ser Phe Ser Lys
 565 570

<210> 26
 <211> 574
 <212> PRT
 <213> Human respiratory syncytial virus

<400> 26

Met Glu Leu Leu Ile His Arg Leu Ser Ala Ile Phe Leu Thr Leu Ala
 1 5 10 15

Ile Asn Ala Leu Tyr Leu Thr Ser Ser Gln Asn Ile Thr Glu Glu Phe
 20 25 30
 Tyr Gln Ser Thr Cys Ser Ala Val Ser Arg Gly Tyr Phe Ser Ala Leu
 35 40 45
 Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
 50 55 60
 Lys Glu Thr Lys Cys Asn Gly Thr Asp Thr Lys Val Lys Leu Ile Lys
 65 70 75 80
 Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
 85 90 95
 Met Gln Asn Thr Pro Ala Ala Asn Asn Arg Ala Arg Arg Glu Ala Pro
 100 105 110
 Gln Tyr Met Asn Tyr Thr Ile Asn Thr Thr Lys Asn Leu Asn Val Ser
 115 120 125
 Ile Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
 130 135 140
 Gly Ser Ala Ile Ala Ser Gly Ile Ala Val Ser Lys Val Leu His Leu
 145 150 155 160
 Glu Gly Glu Val Asn Lys Ile Lys Asn Ala Leu Leu Ser Thr Asn Lys
 165 170 175
 Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
 180 185 190
 Leu Asp Leu Lys Asn Tyr Ile Asn Asn Gln Leu Leu Pro Ile Val Asn
 195 200 205
 Gln Gln Ser Cys Arg Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
 210 215 220
 Gln Lys Asn Ser Arg Leu Leu Glu Ile Asn Arg Glu Phe Ser Val Asn
 225 230 235 240
 Ala Gly Val Thr Thr Pro Leu Ser Thr Tyr Met Leu Thr Asn Ser Glu
 245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
260 265 270

Leu Met Ser Ser Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
275 280 285

Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro
290 295 300

Ile Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
305 310 315 320

Leu Cys Thr Thr Asn Ile Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
340 345 350

Pro Gln Ala Asp Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
355 360 365

Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Ser Leu Cys Asn Thr
370 375 380

Asp Ile Phe Asn Ser Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
385 390 395 400

Asp Ile Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys
405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile
420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp
435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Leu Glu Gly
450 455 460

Lys Asn Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Tyr Tyr Asp Pro
465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn
485 490 495

Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Arg Ser Asp Glu Leu
500 505 510

Leu His Asn Val Asn Thr Gly Lys Ser Thr Thr Asn Ile Met Ile Thr
515 520 525

Thr Ile Ile Ile Val Ile Ile Val Val Leu Leu Ser Leu Ile Ala Ile
530 535 540

Gly Leu Leu Leu Tyr Cys Lys Ala Lys Asn Thr Pro Val Thr Leu Ser
545 550 555 560

Lys Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Lys
565 570

<210> 27

<211> 537

<212> PRT

<213> Pneumonia virus of mice

<400> 27

Met Ile Pro Gly Arg Ile Phe Leu Val Leu Leu Val Ile Phe Asn Thr
1 5 10 15

Lys Pro Ile His Pro Asn Thr Leu Thr Glu Lys Tyr Tyr Glu Ser Thr
20 25 30

Cys Ser Val Glu Thr Ala Gly Tyr Lys Ser Ala Leu Arg Thr Gly Trp
35 40 45

His Met Thr Val Met Ser Ile Lys Leu Ser Gln Ile Asn Ile Glu Ser
50 55 60

Cys Lys Ser Ser Asn Ser Leu Leu Ala His Glu Leu Ala Ile Tyr Ser
65 70 75 80

Ser Ala Val Asp Glu Leu Arg Thr Leu Ser Ser Asn Ala Leu Lys Ser
85 90 95

Lys Arg Lys Lys Arg Phe Leu Gly Leu Ile Leu Gly Leu Gly Ala Ala
100 105 110

Val Thr Ala Gly Val Ala Leu Ala Lys Thr Val Gln Leu Glu Ser Glu
115 120 125

Ile Ala Leu Ile Arg Asp Ala Val Arg Asn Thr Asn Glu Ala Val Val
 130 135 140
 Ser Leu Thr Asn Gly Met Ser Val Leu Ala Lys Val Val Asp Asp Leu
 145 150 155 160
 Lys Asn Phe Ile Ser Lys Glu Leu Leu Pro Lys Ile Asn Arg Val Ser
 165 170 175
 Cys Asp Val His Asp Ile Thr Ala Val Ile Arg Phe Gln Gln Leu Asn
 180 185 190
 Lys Arg Leu Leu Glu Val Ser Arg Glu Phe Ser Ser Asn Ala Gly Leu
 195 200 205
 Thr His Thr Val Ser Ser Phe Met Leu Thr Asp Arg Glu Leu Thr Ser
 210 215 220
 Ile Val Gly Gly Met Ala Val Ser Ala Gly Gln Lys Glu Ile Met Leu
 225 230 235 240
 Ser Ser Lys Ala Ile Met Arg Arg Asn Gly Leu Ala Ile Leu Ser Ser
 245 250 255
 Val Asn Ala Asp Thr Leu Val Tyr Val Ile Gln Leu Pro Leu Phe Gly
 260 265 270
 Val Met Asp Thr Asp Cys Trp Val Ile Arg Ser Ser Ile Asp Cys His
 275 280 285
 Asn Ile Ala Asp Lys Tyr Ala Cys Leu Ala Arg Ala Asp Asn Gly Trp
 290 295 300
 Tyr Cys His Asn Ala Gly Ser Leu Ser Tyr Phe Pro Ser Pro Thr Asp
 305 310 315 320
 Cys Glu Ile His Asn Gly Tyr Ala Phe Cys Asp Thr Leu Lys Ser Leu
 325 330 335
 Thr Val Pro Val Thr Ser Arg Glu Cys Asn Ser Asn Met Tyr Thr Thr
 340 345 350
 Asn Tyr Asp Cys Lys Ile Ser Thr Ser Lys Thr Tyr Val Ser Thr Ala
 355 360 365

Val Leu Thr Thr Met Gly Cys Leu Val Ser Cys Tyr Gly His Asn Ser
 370 375 380

Cys Thr Val Ile Asn Asn Asp Lys Gly Ile Ile Arg Thr Leu Pro Asp
 385 390 395 400

Gly Cys His Tyr Ile Ser Asn Lys Gly Val Asp Arg Val Gln Val Gly
 405 410 415

Asn Thr Val Tyr Tyr Leu Ser Lys Glu Val Gly Lys Ser Ile Val Val
 420 425 430

Arg Gly Glu Pro Leu Val Leu Lys Tyr Asp Pro Leu Ser Phe Pro Asp
 435 440 445

Asp Lys Phe Asp Val Ala Ile Arg Asp Val Glu His Ser Ile Asn Gln
 450 455 460

Thr Arg Thr Phe Phe Lys Ala Ser Asp Gln Leu Leu Asp Leu Ser Glu
 465 470 475 480

Asn Arg Glu Asn Lys Asn Leu Asn Lys Ser Tyr Ile Leu Thr Thr Leu
 485 490 495

Leu Phe Val Val Met Leu Ile Ile Ile Met Ala Val Ile Gly Phe Ile
 500 505 510

Leu Tyr Lys Val Leu Lys Met Ile Arg Asp Asn Lys Leu Lys Ser Lys
 515 520 525

Ser Thr Pro Gly Leu Thr Val Leu Ser
 530 535

<210> 28
 <211> 269
 <212> PRT
 <213> Human metapneumovirus 00-1

<400> 28

Thr Val Asn Val Tyr Leu Pro Asp Ser Tyr Leu Lys Gly Val Ile Ser
 1 5 10 15

Phe Ser Glu Thr Asn Ala Ile Gly Ser Cys Leu Leu Lys Arg Pro Tyr
 20 25 30

Leu Lys Asn Asp Asn Thr Ala Lys Val Ala Ile Glu Asn Pro Val Ile
 35 40 45

Glu His Val Arg Leu Lys Asn Ala Val Asn Ser Lys Met Lys Ile Ser
50 55 60

Asp Tyr Lys Ile Val Glu Pro Val Asn Met Gln His Glu Ile Met Lys
65 70 75 80

Asn Val His Ser Cys Glu Leu Thr Leu Leu Lys Gln Phe Leu Thr Arg
85 90 95

Ser Lys Asn Ile Ser Thr Leu Lys Leu Asn Met Ile Cys Asp Trp Leu
100 105 110

Gln Leu Lys Ser Thr Ser Asp Asp Thr Ser Ile Leu Ser Phe Ile Asp
115 120 125

Val Glu Phe Ile Pro Ser Trp Val Ser Asn Trp Phe Ser Asn Trp Tyr
130 135 140

Asn Leu Asn Lys Leu Ile Leu Glu Phe Arg Lys Glu Glu Val Ile Arg
145 150 155 160

Thr Gly Ser Ile Leu Cys Arg Ser Leu Gly Lys Leu Val Phe Val Val
165 170 175

Ser Ser Tyr Gly Cys Ile Val Lys Ser Asn Lys Ser Lys Arg Val Ser
180 185 190

Phe Phe Thr Tyr Asn Gln Leu Leu Thr Trp Lys Asp Val Met Leu Ser
195 200 205

Arg Phe Asn Ala Asn Phe Cys Ile Trp Val Ser Asn Ser Leu Asn Glu
210 215 220

Asn Gln Glu Gly Leu Gly Leu Arg Ser Asn Leu Gln Gly Ile Leu Thr
225 230 235 240

Asn Lys Leu Tyr Glu Thr Val Asp Tyr Met Leu Ser Leu Cys Cys Asn
245 250 255

Glu Gly Phe Ser Leu Val Lys Glu Phe Glu Gly Phe Ile
260 265

<210> 29

<211> 249

<212> PRT

<213> Avian pneumovirus A

<400> 29

Met Glu Ile Ser Asn Glu Ser Val Val Asn Val Tyr Leu Pro Asp Ser
1 5 10 15

Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
20 25 30

Cys Val Leu Asn Arg Pro Tyr Ile Lys Asp Asp Tyr Thr Ala His Val
35 40 45

Ala Met Thr Asn Pro Val Ile Glu His Gln Arg Leu Arg Ala Leu Phe
50 55 60

Lys Ser Leu Thr Ile Ser Arg Glu Tyr Arg Val Val Glu Pro Leu Met
65 70 75 80

Ile Gln Lys Glu Leu Leu Lys Val Ala Ala Gly Ala Arg Leu Lys Lys
85 90 95

Leu Lys Lys Trp Leu Gly Arg Ser Lys Asp Ile Ser Glu Val Lys Leu
100 105 110

Lys Met Val Thr Asp Trp Leu Lys Leu Ser Gln Thr Pro Gly Arg Gly
115 120 125

Lys Ile Ile Asp Arg Ile Gln Val Glu Asn Leu Pro Asp Trp Leu Glu
130 135 140

His Trp Phe Asp Ser Trp Leu Ile Leu Asn Asp Val Ile Gln Ser Tyr
145 150 155 160

Arg Cys Leu Glu Val Ser Gln Thr Ser Ala Ile Leu Arg Lys Ser Ser
165 170 175

Leu Asn Phe Phe Phe Ala Val Ser Ser Phe Gly Cys Ile Ile Ile Ser
180 185 190

Arg Lys Ser Arg Arg Ile Cys Phe Cys Thr Tyr Asn Gln Leu Leu Thr
195 200 205

Trp Lys Asp Leu Ala Leu Ser Arg Phe Asn Ala Asn Leu Cys Val Trp
210 215 220

Val Ser Asn Cys Leu Asn Ser Ala Gln Asp Gly Leu Gly Leu Arg Ser
 225 230 235 240

Lys Leu Val Gly Glu Leu Leu Asn Arg
 245

<210> 30
 <211> 300
 <212> PRT
 <213> Bovine respiratory syncytial virus
 <400> 30

Met Asp Thr Leu Ile His Glu Asn Ser Thr Asn Val Tyr Leu Thr Asp
 1 5 10 15

Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly
 20 25 30

Ser Tyr Leu Leu Asp Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Ile
 35 40 45

Ile Ser Arg Gln Lys Pro Leu Ile Glu His Ile Asn Leu Lys Lys Leu
 50 55 60

Ser Ile Ile Gln Ser Phe Val Thr Lys Tyr Asn Lys Gly Glu Leu Gly
 65 70 75 80

Leu Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser
 85 90 95

Leu Ser Thr Ser Glu Leu Ile Thr Thr Thr Thr Leu Phe Lys Lys Ile
 100 105 110

Ile Arg Arg Ala Ile Glu Ile Ser Asp Val Lys Val Tyr Ala Ile Leu
 115 120 125

Asn Lys Leu Gly Leu Lys Glu Lys Gly Lys Val Asp Arg Cys Asp Asp
 130 135 140

Thr Asn Thr Thr Leu Ser Asn Ile Val Arg Asp Asn Ile Leu Ser Val
 145 150 155 160

Ile Ser Asp Asn Thr Pro Ser Thr Lys Lys Pro Asn Asn Ser Ser Cys
 165 170 175

Lys Pro Asp Gln Pro Ile Lys Thr Thr Ile Leu Cys Lys Leu Leu Ser
 180 185 190

Ser Met Ser His Pro Pro Thr Trp Leu Ile His Trp Phe Asn Leu Tyr
 195 200 205

Thr Lys Leu Asn Asp Ile Leu Thr Gln Tyr Arg Thr Asn Glu Ala Arg
 210 215 220

Asn His Gly Tyr Ile Leu Ile Asp Thr Arg Thr Leu Gly Glu Phe Gln
 225 230 235 240

Phe Ile Leu Asn Gln Tyr Gly Cys Ile Val Tyr His Lys Lys Leu Lys
 245 250 255

Lys Ile Thr Ile Thr Thr Tyr Asn Gln Phe Leu Thr Trp Lys Asp Ile
 260 265 270

Ser Leu Ser Arg Leu Asn Val Cys Met Ile Thr Trp Ile Ser Asn Cys
 275 280 285

Leu Asn Thr Leu Asn Lys Ser Leu Gly Leu Arg Cys
 290 295 300

<210> 31
 <211> 300
 <212> PRT
 <213> Respiratory syncytial virus

<400> 31

Met Asp Pro Ile Ile Asn Gly Asn Ser Ala Asn Val Tyr Leu Thr Asp
 1 5 10 15

Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly
 20 25 30

Ser Tyr Ile Phe Asn Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Leu
 35 40 45

Ile Ser Arg Gln Asn Pro Leu Ile Glu His Ile Asn Leu Lys Lys Leu
 50 55 60

Asn Ile Thr Gln Ser Leu Met Ser Lys Tyr His Lys Gly Glu Ile Lys
 65 70 75 80

Ile Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser
 85 90 95

Met Thr Ser Leu Glu Gln Ile Thr Thr Thr Asn Leu Leu Lys Lys Ile
100 105 110

Ile Arg Arg Ala Ile Glu Ile Ser Asp Val Lys Val Tyr Ala Ile Leu
115 120 125

Asn Lys Leu Gly Leu Lys Glu Lys Asp Lys Ile Lys Ser Asn Asn Gly
130 135 140

Gln Asp Glu Asp Asn Ser Val Ile Thr Thr Ile Ile Lys Asp Asp Ile
145 150 155 160

Leu Leu Ala Val Lys Asp Asn Gln Ser His Leu Lys Ala Val Lys Asn
165 170 175

His Ser Thr Lys Gln Lys Asp Thr Ile Lys Thr Thr Leu Leu Lys Lys
180 185 190

Leu Met Cys Ser Met Gln His Pro Pro Ser Trp Leu Ile His Trp Phe
195 200 205

Asn Leu Tyr Thr Lys Leu Asn Asn Ile Leu Thr Gln Tyr Arg Ser Ser
210 215 220

Glu Val Lys Asn His Gly Phe Ile Leu Ile Asp Asn His Thr Leu Asn
225 230 235 240

Gly Phe Gln Phe Ile Leu Asn Gln Tyr Gly Cys Ile Val Tyr His Lys
245 250 255

Glu Leu Lys Arg Ile Thr Val Thr Thr Tyr Asn Gln Phe Leu Thr Trp
260 265 270

Lys Asn Ile Ser Leu Ser Arg Leu Asn Val Cys Leu Ile Thr Trp Ile
275 280 285

Ser Asn Cys Leu Asn Thr Leu Asn Lys Ser Leu Gly
290 295 300

<210> 32

<211> 108

<212> PRT

<213> Human metapneumovirus 00-1

<400> 32

Lys Leu Val Asp Lys Ile Thr Ser Asp Gln His Ile Phe Ser Pro Asp
1 5 10 15

Lys Ile Asp Met Leu Thr Leu Gly Lys Met Leu Met Pro Thr Ile Lys
20 25 30

Gly Gln Lys Thr Asp Gln Phe Leu Asn Lys Arg Glu Asn Tyr Phe His
35 40 45

Gly Asn Asn Leu Ile Glu Ser Leu Ser Ala Ala Leu Ala Cys His Trp
50 55 60

Cys Gly Ile Leu Thr Glu Gln Cys Ile Glu Asn Asn Ile Phe Lys Lys
65 70 75 80

Asp Trp Gly Asp Gly Phe Ile Ser Asp His Ala Phe Met Asp Phe Lys
85 90 95

Ile Phe Leu Cys Val Phe Lys Thr Lys Leu Leu Cys
100 105

<210> 33

<211> 110

<212> PRT

<213> Avian pneumovirus A

<400> 33

Phe Lys Ser Val Arg Lys Ile Val Thr Asp Gln His Ile Phe Asn Pro
1 5 10 15

Asp His Ile Asp Leu Val Met Leu Gly Lys Leu Leu Leu Pro Thr Val
20 25 30

Arg Ser Asn Ile Asn Asn Asn Lys Pro Ala Thr Glu Asn Phe Phe Asn
35 40 45

Gly Asn Asn Ile Val Glu Ala Leu Thr Ser Cys Leu Ala Cys His Trp
50 55 60

Cys Thr Val Leu Ile Leu Leu Thr Thr Glu Asn Ser Ile Phe Gln Lys
65 70 75 80

Glu Trp Gly Asp Gly Phe Ile Thr Asp His Ala Phe Ile Asn Phe Thr
85 90 95

Trp Phe Leu Met Ser Phe Lys Thr Tyr Leu Leu Cys His Trp
100 105 110

<210> 34
<211> 110
<212> PRT
<213> Bovine respiratory syncytial virus

<400> 34

Ile Cys Lys Leu Asn Gln Val Ile Gln Lys Gln His Met Phe Leu Pro
1 5 10 15

Asp Lys Ile Ser Leu Ser Gln Tyr Val Glu Leu Phe Leu Ser Asn Lys
20 25 30

Thr Leu Lys Asn Ser Pro His Ile Ser Ser Asn Leu Val Leu Val His
35 40 45

Lys Met Ser Asp Tyr Phe Leu His Lys Tyr Val Leu Ser Thr Asn Leu
50 55 60

Ala Gly His Trp Ile Met Ile Ile Gln Leu Met Lys Asp Ser Lys Gly
65 70 75 80

Ile Phe Glu Lys Asp Trp Gly Glu Gly Tyr Ile Thr Asp His Met Phe
85 90 95

Leu Asp Leu Asn Val Phe Phe Asp Ala Tyr Lys Thr Tyr Leu
100 105 110

<210> 35
<211> 110
<212> PRT
<213> Respiratory syncytial virus

<400> 35

Asp Ile His Lys Leu Lys Gln Val Ile Gln Lys Gln His Met Phe Leu
1 5 10 15

Pro Asp Lys Ile Ser Leu Thr Gln Tyr Val Glu Leu Phe Leu Ser Asn
20 25 30

Lys Thr Leu Lys Ser Gly Ser His Val Asn Ser Asn Leu Ile Leu Ala
35 40 45

His Lys Ile Ser Asp Tyr Phe His Asn Thr Tyr Ile Leu Ser Thr Asn
50 55 60

Leu Ala Gly His Trp Ile Leu Ile Ile Gln Leu Met Lys Asp Ser Lys
65 70 75 80

Gly Ile Phe Glu Lys Asp Trp Gly Glu Gly Tyr Ile Thr Asp His Met
85 90 95

Phe Ile Asn Leu Lys Val Phe Phe Asn Ala Tyr Lys Thr Tyr
100 105 110

<210> 36
<211> 4739
<212> DNA
<213> Human metapneumovirus 00-1

<400> 36
acgcgtataa attagattca aaaaaatatg ggacaagtga aaatgtctct tcaagggatt 60
cacctgagtg atttatcata caagcatgct atattaaaag agtctcagta cacaataaaa 120
agagatgtgg gtacaacaac tgcagtgaca ccctcatcat tgcaacaaga aataacactg 180
ttgtgtggag aaattctgta tgctaaacat gctgactaca aatatgctgc agaaatagga 240
atacaatata ttagcacagc tttaggatca gagagagtgc agcagattct gaggaactca 300
ggcagtgaag tccaagtggc cttaaccaga acgtactctc tggggaaaat taaaaacaat 360
aaaggagaag atttacagat gttagacata cacggggtag agaagagctg ggtagaagag 420
atagacaaag aagcaaggaa aacwatggca accttgctta aggaatcatc aggtaatatc 480
ccacaaaatc agaggccctc agcaccagac acaccataa tcttattatg tgtaggtgcc 540
ttaatattca ctaaaactagc atcaaccata gaagtgggac tagagaccac agtcagaagg 600
gctaaccgtg tactaagtga tgcactcaag agatacccta gaatggacat accaaagatt 660
gccagatcct tctatgactt atttgaacaa aaagtgtatc acagaagttt gttcattgag 720
tatggcaaag cattaggctc atcatctaca ggcagcaaag cagaaagtct atttgttaat 780
atattcatgc aagcttatgg ggccggtcaa acaatgctaa ggtggggggg cattgccagg 840
tcatccaaca atataatggt aggacatgta tccgtccaag ctgagttaaa acaggtcaca 900
gaagtctatg acttggtgag agaaatgggc cctgaatctg gacttctaca ttttaaggcaa 960
agcccaaaaag ctggactggt atcactagcc aactgtccca actttgcaag tgttgttctc 1020
ggaaatgcct caggcttagg cataatcggc atgtatcgag ggagagtacc aaacacagaa 1080
ttattttcag cagctgaaag ttatgcaaaa agtttgaaag aaagcaataa aataaatttc 1140
tcttcattag gacttacaga tgaagagaaa gaggctgcag aacatttctt aaatgtgagt 1200

gacgacagtc	aaaatgatta	tgagtaatta	aaaaagtggg	acaagtcaaa	atgtcattcc	1260
ctgaaggaaa	agatattctt	ttcatgggta	atgaagcagc	aaaattagca	gaagctttcc	1320
agaaatcatt	aagaaaacca	ggtcataaaa	gatctcaatc	tattatagga	gaaaaagtga	1380
atactgtatc	agaaacattg	gaattaccta	ctatcagtag	acctgcaaaa	ccaaccatac	1440
cgtcagaacc	aaagtttagca	tggacagata	aaggtggggc	aacaaaaact	gaaataaagc	1500
aagcaatcaa	agtcattggat	cccattgaag	aagaagagtc	taccgagaag	aaggtgctac	1560
cctccagtga	tgggaaaacc	cctgcagaaa	agaaactgaa	accatcaact	aacaccaaaa	1620
agaagggtttc	atttacacca	aatgaaccag	ggaaatatac	aaagttggaa	aaagatgctc	1680
tagatttgct	ctcagataat	gaagaagaag	atgcagaatc	ttcaatctta	acctttgaag	1740
aaagagatac	ttcatcatta	agcattgagg	ccagattgga	atcaatagag	gagaaattaa	1800
gcatgatatt	agggtctatta	agaacactca	acattgctac	agcaggagccc	acagcagcaa	1860
gagatgggat	cagagatgca	atgattggcg	taagagagga	attaatagca	gacataataa	1920
aggaagctaa	agggaaagca	gcagaaatga	tggagagga	aatgaktcaa	cgatcaaaaa	1980
taggaaatgg	tagtgtaaaa	ttaacagaaa	aagcaaaaga	gctcaacaaa	attggtgaag	2040
atgaaagcac	aagtggagaa	tccgaagaag	agaagaacc	aaaagacaca	caagacaata	2100
gtcaagaaga	tgacatttac	cagttaatta	tgtagtttaa	taaaaataaa	caatgggaca	2160
agtaaaaatg	gagtctctacc	tagtagacac	ctatcaaggc	attccttaca	cagcagctgt	2220
tcaagttgat	ctaatagaaa	aggacctgtt	acctgcaagc	ctaacaatat	ggttcccttt	2280
gtttcaggcc	aacacaccac	cagcagtgtc	gctcgatcag	ctaaaaaccc	tgacaataac	2340
cactctgtat	gctgcatcac	aaaatgggcc	aatactcaaa	gtgaatgcat	cagcccaagg	2400
tgcagcaatg	tttgtacttc	ccaaaaaatt	tgaagtcaat	gcgactgtag	camtcgatga	2460
atatagcaaa	ctggaatttg	acaaactcac	agtctgtgaa	gtaaaaacag	tttacttaac	2520
aacctgaaa	ccatacggga	tggtatcaaa	atgtgtgagc	tcagccaaat	cagttggcaa	2580
aaaaacacat	gatctaatac	cactatgtga	ttttatggat	ctagaaaaga	acacacctgt	2640
tacaatacca	gcattcatca	aatcagtttc	aatcaaagag	agtgagtcag	ctactgttga	2700
agctgctata	agcagtgaag	cagaccaagc	tctaacacag	gccaaaattg	caccttatgc	2760
gggattaatt	atgatcatga	ctatgaacaa	tcccaaaggc	atattcaaaa	agcttgagc	2820
tgggactcaa	gtcatagtag	aactaggagc	atatgtccag	gctgaaagca	taagcaaaat	2880
atgcaagact	tggagccatc	aagggacaag	atatgtcttg	aagtcagat	aacaaccaag	2940
caccttggcc	aagagctact	aaccctatct	catagatcat	aaagtcacca	ttctagttat	3000
ataaaaaatca	agttagaaca	agaattaaat	caatcaagaa	cgggacaaat	aaaaatgtct	3060

tggaagtgg	tgatcakttt	ttcattgtta	ataacacctc	racacggtct	taaagagagc	3120
tacttagaag	agtcattgtag	cactataact	gaaggatata	tcagtgttct	gaggacaggt	3180
tggtacacca	atgttttttac	actggaggta	ggcgatgtag	agaaccttac	atgtgccgat	3240
ggaccagct	taataaaaac	agaattagac	ctgacaaaaa	gtgcactaag	agagctcaga	3300
acagtttctg	ctgatcaact	ggcaagagag	gagcaaattg	aaaatcccag	acaatctaga	3360
ttcgttctag	gagcaatagc	actcgggtgt	gcaactgcag	ctgcagttac	agcagggtgt	3420
gcaattgcc	aaaccatccg	gcttgaaagt	gaagtaacag	caattaagaa	tgcctcaaaa	3480
aagaccaatg	aagcagtata	tacattgggg	aatggagttc	gtgtgttggc	aactgcagtg	3540
agagaactga	aagattttgt	gagcaagaat	ctaacacgtg	caatcaacaa	aaacaagtgc	3600
gacattgctg	acctgaaaaa	ggcggttagc	ttcagtcaat	tcaacagaag	gttcctaaat	3660
gttgctggc	aatttttcaga	caacgctgga	ataacaccag	caatatcttt	ggacttaatg	3720
acagatgctg	aactagccag	agctgtttcc	aacatgccaa	catctgcagg	acaaataaaa	3780
ctgatgttgg	agaaccgtgc	aatggtaaga	agaaaagggt	tcggattcct	gataggagtt	3840
tacggaagct	ccgtaattya	catggtgcaa	ctgccaatct	ttggggttat	agacacgcct	3900
tgctggatag	taaaagcagc	cccttcttgt	tcaggaaaaa	agggaaacta	tgcttgcttc	3960
ttaagagaag	accaaggatg	gtattgtcaa	aatgcagggt	caactgttta	ctacccaaat	4020
gaaaaagact	gtgaaacaag	aggagaccat	gtcttttgcg	acacagcagc	aggaatcaat	4080
gttgctgagc	agtcaargga	gtgcaacata	aacatatcta	ctactaatta	cccatgcaaa	4140
gttagcacag	gaagacatcc	tatcagtatg	gttgactat	ctcctcttgg	ggctytggtt	4200
gcttgctaca	agggagtgag	ctgttccatt	ggcagcaaca	gagtagggat	catcaagcaa	4260
ctgaacaaag	gctgctctta	tataaccaac	caagacgcag	acacagtgac	aatagacaac	4320
actgtatacc	agctaagcaa	agttgaaggc	gaacagcatg	ttataaaaagg	aaggccagtg	4380
tcaagcagct	ttgacctcag	caagtttcct	gaagatcaat	tcaatgttgc	acttgaccaa	4440
gttttcgaga	gcattgagaa	cagtcaggcc	ttggtggatc	aatcaaacag	aatcctaagc	4500
agtgcagaga	aaggaaacac	tggttcatc	attgtaataa	ttctaattgc	tgtccttggc	4560
tctaccatga	tcctagttag	tgtttttatc	ataataaaga	aaacaaagag	acccacagga	4620
gcacctccag	agctgagtg	tgtcacaaac	aatggcttca	taccacataa	ttagttaatt	4680
aaaaataaat	taaaataaat	taaaattaaa	aataaaaatt	tgggacaaat	cataatgtc	4739

<210> 37
<211> 399

<212> PRT

<213> Human metapneumovirus 00-1

<400> 37

Met Gly Gln Val Lys Met Ser Leu Gln Gly Ile His Leu Ser Asp Leu
1 5 10 15

Ser Tyr Lys His Ala Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg
20 25 30

Asp Val Gly Thr Thr Thr Ala Val Thr Pro Ser Ser Leu Gln Gln Glu
35 40 45

Ile Thr Leu Leu Cys Gly Glu Ile Leu Tyr Ala Lys His Ala Asp Tyr
50 55 60

Lys Tyr Ala Ala Glu Ile Gly Ile Gln Tyr Ile Ser Thr Ala Leu Gly
65 70 75 80

Ser Glu Arg Val Gln Gln Ile Leu Arg Asn Ser Gly Ser Glu Val Gln
85 90 95

Val Val Leu Thr Arg Thr Tyr Ser Leu Gly Lys Ile Lys Asn Asn Lys
100 105 110

Gly Glu Asp Leu Gln Met Leu Asp Ile His Gly Val Glu Lys Ser Trp
115 120 125

Val Glu Glu Ile Asp Lys Glu Ala Arg Lys Thr Met Ala Thr Leu Leu
130 135 140

Lys Glu Ser Ser Gly Asn Ile Pro Gln Asn Gln Arg Pro Ser Ala Pro
145 150 155 160

Asp Thr Pro Ile Ile Leu Leu Cys Val Gly Ala Leu Ile Phe Thr Lys
165 170 175

Leu Ala Ser Thr Ile Glu Val Gly Leu Glu Thr Thr Val Arg Arg Ala
180 185 190

Asn Arg Val Leu Ser Asp Ala Leu Lys Arg Tyr Pro Arg Met Asp Ile
195 200 205

Pro Lys Ile Ala Arg Ser Phe Tyr Asp Leu Phe Glu Gln Lys Val Tyr
210 215 220

His Arg Ser Leu Phe Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser
 225 230 235 240

Thr Gly Ser Lys Ala Glu Ser Leu Phe Val Asn Ile Phe Met Gln Ala
 245 250 255

Tyr Gly Ala Gly Gln Thr Met Leu Arg Trp Gly Val Ile Ala Arg Ser
 260 265 270

Ser Asn Asn Ile Met Leu Gly His Val Ser Val Gln Ala Glu Leu Lys
 275 280 285

Gln Val Thr Glu Val Tyr Asp Leu Val Arg Glu Met Gly Pro Glu Ser
 290 295 300

Gly Leu Leu His Leu Arg Gln Ser Pro Lys Ala Gly Leu Leu Ser Leu
 305 310 315 320

Ala Asn Cys Pro Asn Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly
 325 330 335

Leu Gly Ile Ile Gly Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu
 340 345 350

Phe Ser Ala Ala Glu Ser Tyr Ala Lys Ser Leu Lys Glu Ser Asn Lys
 355 360 365

Ile Asn Phe Ser Ser Leu Gly Leu Thr Asp Glu Glu Lys Glu Ala Ala
 370 375 380

Glu His Phe Leu Asn Val Ser Asp Asp Ser Gln Asn Asp Tyr Glu
 385 390 395

<210> 38
 <211> 781
 <212> DNA
 <213> Human metapneumovirus 00-1

<400> 38
 caagaaaaaa actgttccac tgtaaatgtc tatcttctcg actcatatct taaaggagtg 60
 atttccttta gtgagactaa tgcaattggc tcatgtctct taaaaagacc ttacctaaaa 120
 aatgacaaca ctgcaaaagt tgccatagag aatcctgtta tcgagcatgt tagactcaaa 180
 aatgcagtca attctaagat gaaaatatca gattacaaga tagtagagcc agtaaacadg 240
 caacatgaaa ttatgaagaa tgtacacagt tgtgagctca cattattaaa acagttttta 300
 acaaggagta aaaatattag cactctcaaa ttaaatatga tatgtgattg gctgcagtta 360

aagtctacat cagatgatac ctcaatccta agttttatag atgtagaatt tatacctagc 420
tgggtaagca attggtttag taattggtac aatctcaaca agttgattct ggaattcagg 480
aaagaagaag taataagaac tggttcaatc ttgtgtaggt cattgggtaa attagttttt 540
gttgatcat catatggatg tatagtcaag agcaacaaaa gcaaaagagt gagcttcttc 600
acatacaatc aactgttaac atggaaagat gtgatgttaa gtagattcaa tgcaaatttt 660
tgtatatggg taagcaacag tctgaatgaa aatcaagaag gggtagggtt gagaagtaat 720
ttgcaaggca tattaactaa taagctatat gaaactgtag attatatgct tagtttatgt 780
t 781

<210> 39
<211> 260
<212> PRT
<213> Human metapneumovirus 00-1

<400> 39

Gln Glu Lys Asn Cys Ser Thr Val Asn Val Tyr Leu Pro Asp Ser Tyr
1 5 10 15

Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser Cys
20 25 30

Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val Ala
35 40 45

Ile Glu Asn Pro Val Ile Glu His Val Arg Leu Lys Asn Ala Val Asn
50 55 60

Ser Lys Met Lys Ile Ser Asp Tyr Lys Ile Val Glu Pro Val Asn Met
65 70 75 80

Gln His Glu Ile Met Lys Asn Val His Ser Cys Glu Leu Thr Leu Leu
85 90 95

Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Thr Leu Lys Leu Asn
100 105 110

Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asp Thr Ser
115 120 125

Ile Leu Ser Phe Ile Asp Val Glu Phe Ile Pro Ser Trp Val Ser Asn
130 135 140

Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe Arg
 145 150 155 160

Lys Glu Glu Val Ile Arg Thr Gly Ser Ile Leu Cys Arg Ser Leu Gly
 165 170 175

Lys Leu Val Phe Val Val Ser Ser Tyr Gly Cys Ile Val Lys Ser Asn
 180 185 190

Lys Ser Lys Arg Val Ser Phe Phe Thr Tyr Asn Gln Leu Leu Thr Trp
 195 200 205

Lys Asp Val Met Leu Ser Arg Phe Asn Ala Asn Phe Cys Ile Trp Val
 210 215 220

Ser Asn Ser Leu Asn Glu Asn Gln Glu Gly Val Gly Leu Arg Ser Asn
 225 230 235 240

Leu Gln Gly Ile Leu Thr Asn Lys Leu Tyr Glu Thr Val Asp Tyr Met
 245 250 255

Leu Ser Leu Cys
 260

<210> 40
 <211> 327
 <212> DNA
 <213> Human metapneumovirus 00-1

<400> 40
 ataagctagt agataagata acttctgac aacatatctt cagtccagac aaaatagata 60
 tgttaacact ggggaaaatg ctcatgccca ctataaaagg tcagaaaaca gatcagttcc 120
 tgaacaagag agagaattat ttccatggga ataattctat tgagtctttg tcagcagcgt 180
 tagcatgtca ttgggtgtggg atattaacag agcaatgtat agaaaataat attttcaaga 240
 aagactgggg tgacggggtc atatcggatc atgcttttat ggacttcaaa atattcctat 300
 gtgtctttta aactaaactt ttatgta 327

<210> 41
 <211> 108
 <212> PRT
 <213> Human metapneumovirus 00-1

<400> 41

Lys Leu Val Asp Lys Ile Thr Ser Asp Gln His Ile Phe Ser Pro Asp
 1 5 10 15

Lys Ile Asp Met Leu Thr Leu Gly Lys Met Leu Met Pro Thr Ile Lys
 20 25 30

Gly Gln Lys Thr Asp Gln Phe Leu Asn Lys Arg Glu Asn Tyr Phe His
 35 40 45

Gly Asn Asn Leu Ile Glu Ser Leu Ser Ala Ala Leu Ala Cys His Trp
 50 55 60

Cys Gly Ile Leu Thr Glu Gln Cys Ile Glu Asn Asn Ile Phe Lys Lys
 65 70 75 80

Asp Trp Gly Asp Gly Phe Ile Ser Asp His Ala Phe Met Asp Phe Lys
 85 90 95

Ile Phe Leu Cys Val Phe Lys Thr Lys Leu Leu Cys
 100 105

<210> 42
 <211> 391
 <212> PRT
 <213> Human respiratory syncytial virus A

<400> 42

Met Ala Leu Ser Lys Val Lys Leu Asn Asp Thr Leu Asn Lys Asp Gln
 1 5 10 15

Leu Leu Ser Ser Ser Lys Tyr Thr Ile Gln Arg Ser Thr Gly Asp Ser
 20 25 30

Ile Asp Thr Pro Asn Tyr Asp Val Gln Lys His Ile Asn Lys Leu Cys
 35 40 45

Gly Met Leu Leu Ile Thr Glu Asp Ala Asn His Lys Phe Thr Gly Leu
 50 55 60

Ile Gly Met Leu Tyr Ala Met Ser Arg Leu Gly Arg Glu Asp Thr Ile
 65 70 75 80

Lys Ile Leu Arg Asp Ala Gly Tyr His Val Lys Ala Asn Gly Val Asp
 85 90 95

Val Thr Thr His Arg Gln Asp Ile Asn Gly Lys Glu Met Lys Phe Glu
 100 105 110

Val Leu Thr Leu Ala Ser Leu Thr Thr Glu Ile Gln Ile Asn Ile Glu
115 120 125
Ile Glu Ser Arg Lys Ser Tyr Lys Lys Met Leu Lys Glu Met Gly Glu
130 135 140
Val Ala Pro Glu Tyr Arg His Asp Ser Pro Asp Cys Gly Met Ile Ile
145 150 155 160
Leu Cys Ile Ala Ala Leu Val Ile Thr Lys Leu Ala Ala Gly Asp Arg
165 170 175
Ser Gly Leu Thr Ala Val Ile Arg Arg Ala Asn Asn Val Leu Lys Asn
180 185 190
Glu Met Lys Arg Tyr Lys Gly Leu Leu Pro Lys Asp Ile Ala Asn Ser
195 200 205
Phe Tyr Glu Val Phe Glu Lys His Pro His Phe Ile Asp Val Phe Val
210 215 220
His Phe Gly Ile Ala Gln Ser Ser Thr Arg Gly Gly Ser Arg Val Glu
225 230 235 240
Gly Ile Phe Ala Gly Leu Phe Met Asn Ala Tyr Gly Ala Gly Gln Val
245 250 255
Met Leu Arg Trp Gly Val Leu Ala Lys Ser Val Lys Asn Ile Met Leu
260 265 270
Gly His Ala Ser Val Gln Ala Glu Met Glu Gln Val Val Glu Val Tyr
275 280 285
Glu Tyr Ala Gln Lys Leu Gly Gly Glu Ala Gly Phe Tyr His Ile Leu
290 295 300
Asn Asn Pro Lys Ala Ser Leu Leu Ser Leu Thr Gln Phe Pro His Phe
305 310 315 320
Ser Ser Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Met Gly Glu
325 330 335
Tyr Arg Gly Thr Pro Arg Asn Gln Asp Leu Tyr Asp Ala Ala Lys Ala
340 345 350

Tyr Ala Glu Gln Leu Lys Glu Asn Gly Val Ile Asn Tyr Ser Val Leu
 355 360 365

Asp Leu Thr Ala Glu Glu Leu Glu Ala Ile Lys His Gln Leu Asn Pro
 370 375 380

Lys Asp Asn Asp Val Glu Leu
 385 390

<210> 43
 <211> 279
 <212> PRT
 <213> Avian pneumovirus B

<400> 43

Met Ser Leu Pro Glu Gly Lys Asp Ile Leu Met Met Gly Ser Glu Ala
 1 5 10 15

Ala Lys Leu Ala Glu Ala Tyr Gln Gln Ser Ile Lys Asn Ser Thr Ser
 20 25 30

Val Arg Arg Ser Ile Ser Gly Asp Pro Val Ser Thr Val Ser Glu Lys
 35 40 45

Val Pro Leu Pro Pro Leu Cys Ser Ser Glu Thr Ser Arg Gly Ala Cys
 50 55 60

Ile Arg Pro Thr Lys Ser Thr Leu Pro Pro Ile Lys Glu Val Glu Ser
 65 70 75 80

Ile Tyr Pro Lys Leu Pro Thr Ala Pro Pro Asp Ala Met Ile Glu Thr
 85 90 95

Ala His Pro Ile Gly Ala Pro Lys Lys Ala Gln Lys Arg Val Lys Phe
 100 105 110

Glu Ser Ser Lys Ala Gly Lys Tyr Thr Lys Leu Glu Glu Glu Ala Leu
 115 120 125

Glu Leu Leu Ser Asp Pro Asp Glu Asp Asn Asp Glu Lys Ser Ser Val
 130 135 140

Leu Thr Phe Glu Glu Lys Asp Asn Ala Pro Ser Ser Ile Glu Ala Arg
 145 150 155 160

Leu Glu Ala Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Met Leu Lys
 165 170 175

Thr Leu Ser Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile
180 185 190

Arg Asp Ala Met Val Gly Val Arg Glu Glu Leu Ile Asn Ser Ile Met
195 200 205

Ala Glu Ala Lys Gly Lys Ile Ala Glu Ile Ile Lys Glu Glu Asp Ala
210 215 220

Gln Arg Ala Lys Ile Gly Asp Gly Ser Val Lys Leu Thr Glu Lys Ala
225 230 235 240

Arg Glu Leu Asn Arg Met Leu Glu Asp Gln Ser Ser Ser Gly Glu Ser
245 250 255

Glu Thr Glu Ser Glu Glu Thr Glu Pro Asp Thr Asp Gly Glu Asn Asp
260 265 270

Asp Ile Tyr Ser Phe Asp Met
275

<210> 44
<211> 241
<212> PRT
<213> Human respiratory syncytial virus A

<400> 44

Met Glu Lys Phe Ala Pro Glu Phe His Gly Glu Asp Ala Asn Asn Arg
1 5 10 15

Ala Thr Lys Phe Leu Glu Ser Ile Lys Gly Lys Phe Thr Ser Pro Lys
20 25 30

Asp Pro Lys Lys Lys Asp Ser Ile Ile Ser Val Asn Ser Ile Asp Ile
35 40 45

Glu Val Thr Lys Glu Ser Pro Ile Thr Ser Asn Ser Thr Ile Ile Asn
50 55 60

Pro Thr Asn Glu Thr Asp Asp Thr Ala Gly Asn Lys Pro Asn Tyr Gln
65 70 75 80

Arg Lys Pro Leu Val Ser Phe Lys Glu Asp Pro Thr Pro Ser Asp Asn
85 90 95

Pro Phe Ser Lys Leu Tyr Lys Glu Thr Ile Glu Thr Phe Asp Asn Asn
100 105 110

Glu Glu Glu Ser Ser Tyr Ser Tyr Glu Glu Ile Asn Asp Gln Thr Asn
115 120 125

Asp Asn Ile Thr Ala Arg Leu Asp Arg Ile Asp Glu Lys Leu Ser Glu
130 135 140

Ile Leu Gly Met Leu His Thr Leu Val Val Ala Ser Ala Gly Pro Thr
145 150 155 160

Ser Ala Arg Asp Gly Ile Arg Asp Ala Met Ile Gly Leu Arg Glu Glu
165 170 175

Met Ile Glu Lys Ile Arg Thr Glu Ala Leu Met Thr Asn Asp Arg Leu
180 185 190

Glu Ala Met Ala Arg Leu Arg Asn Glu Glu Ser Glu Lys Met Ala Lys
195 200 205

Asp Thr Ser Asp Glu Val Ser Leu Asn Pro Thr Ser Glu Lys Leu Asn
210 215 220

Asn Leu Leu Glu Gly Asn Asp Ser Asp Asn Asp Leu Ser Leu Glu Asp
225 230 235 240

Phe

<210> 45
<211> 256
<212> PRT
<213> Human respiratory syncytial virus A

<400> 45

Met Glu Thr Tyr Val Asn Lys Leu His Glu Gly Ser Thr Tyr Thr Ala
1 5 10 15

Ala Val Gln Tyr Asn Val Leu Glu Lys Asp Asp Asp Pro Ala Ser Leu
20 25 30

Thr Ile Trp Val Pro Met Phe Gln Ser Ser Met Pro Ala Asp Leu Leu
35 40 45

Ile Lys Glu Leu Ala Asn Val Asn Ile Leu Val Lys Gln Ile Ser Thr
50 55 60

Pro Lys Gly Pro Ser Leu Arg Val Met Ile Asn Ser Arg Ser Ala Val
65 70 75 80

Leu Ala Gln Met Pro Ser Lys Phe Thr Ile Cys Ala Asn Val Ser Leu
85 90 95

Asp Glu Arg Ser Lys Leu Ala Tyr Asp Val Thr Thr Pro Cys Glu Ile
100 105 110

Lys Ala Cys Ser Leu Thr Cys Leu Lys Ser Lys Asn Met Leu Thr Thr
115 120 125

Val Lys Asp Leu Thr Met Lys Thr Leu Asn Pro Thr His Asp Ile Ile
130 135 140

Ala Leu Cys Glu Phe Glu Asn Ile Val Thr Ser Lys Lys Val Ile Ile
145 150 155 160

Pro Thr Tyr Leu Arg Ser Ile Ser Val Arg Asn Lys Asp Leu Asn Thr
165 170 175

Leu Glu Asn Ile Thr Thr Thr Glu Phe Lys Asn Ala Ile Thr Asn Ala
180 185 190

Lys Ile Ile Pro Tyr Ser Gly Leu Leu Leu Val Ile Thr Val Thr Asp
195 200 205

Asn Lys Gly Ala Phe Lys Tyr Ile Lys Pro Gln Ser Gln Phe Ile Val
210 215 220

Asp Leu Gly Ala Tyr Leu Glu Lys Glu Ser Ile Tyr Tyr Val Thr Thr
225 230 235 240

Asn Trp Lys His Thr Ala Thr Arg Phe Ala Ile Lys Pro Met Glu Asp
245 250 255

<210> 46

<211> 574

<212> PRT

<213> Human respiratory syncytial virus A

<400> 46

Met Glu Leu Leu Ile Leu Lys Ala Asn Ala Ile Thr Thr Ile Leu Thr
1 5 10 15

Ala Val Thr Phe Cys Phe Ala Ser Gly Gln Asn Ile Thr Glu Glu Phe
 20 25 30

Tyr Gln Ser Thr Cys Ser Ala Val Ser Lys Gly Tyr Leu Ser Ala Leu
 35 40 45

Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
 50 55 60

Lys Glu Asn Lys Cys Asn Gly Thr Asp Ala Lys Val Lys Leu Ile Lys
 65 70 75 80

Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
 85 90 95

Met Gln Ser Thr Pro Pro Thr Asn Asn Arg Ala Arg Arg Glu Leu Pro
 100 105 110

Arg Phe Met Asn Tyr Thr Leu Asn Asn Ala Lys Lys Thr Asn Val Thr
 115 120 125

Leu Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
 130 135 140

Gly Ser Ala Ile Ala Ser Gly Val Ala Val Ser Lys Val Leu His Leu
 145 150 155 160

Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu Ser Thr Asn Lys
 165 170 175

Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
 180 185 190

Leu Asp Leu Lys Asn Tyr Ile Asp Lys Gln Leu Leu Pro Ile Val Asn
 195 200 205

Lys Gln Ser Cys Ser Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
 210 215 220

Gln Lys Asn Asn Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn
 225 230 235 240

Ala Gly Val Thr Thr Pro Val Ser Thr Tyr Met Leu Thr Asn Ser Glu
 245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
 260 265 270

Leu Met Ser Asn Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
 275 280 285

Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro
 290 295 300

Leu Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
 305 310 315 320

Leu Cys Thr Thr Asn Thr Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
 325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
 340 345 350

Pro Gln Ala Glu Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
 355 360 365

Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Ile Asn Leu Cys Asn Val
 370 375 380

Asp Ile Phe Asn Pro Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
 385 390 395 400

Asp Val Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys
 405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile
 420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Met Asp
 435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Gln Glu Gly
 450 455 460

Lys Ser Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Phe Tyr Asp Pro
 465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn
 485 490 495

Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Lys Ser Asp Glu Leu
500 505 510

Leu His Asn Val Asn Ala Gly Lys Ser Thr Thr Asn Ile Met Ile Thr
515 520 525

Thr Ile Ile Ile Val Ile Ile Val Ile Leu Leu Ser Leu Ile Ala Val
530 535 540

Gly Leu Leu Leu Tyr Cys Lys Ala Arg Ser Thr Pro Val Thr Leu Ser
545 550 555 560

Lys Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Asn
565 570

<210> 47
<211> 187
<212> PRT
<213> Human metapneumovirus

<400> 47

Met Ser Arg Lys Ala Pro Cys Lys Tyr Glu Val Arg Gly Lys Cys Asn
1 5 10 15

Arg Gly Ser Glu Cys Lys Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
20 25 30

Arg Tyr Leu Leu Ile Arg Ser Asn Tyr Leu Leu Asn Gln Leu Leu Arg
35 40 45

Asn Thr Asp Arg Ala Asp Gly Leu Ser Ile Ile Ser Gly Ala Gly Arg
50 55 60

Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
65 70 75 80

Gly Tyr Ile Asp Asp Asn Gln Ser Ile Thr Lys Ala Ala Ala Cys Tyr
85 90 95

Ser Leu His Asn Ile Ile Lys Gln Leu Gln Glu Val Glu Val Arg Gln
100 105 110

Ala Arg Asp Asn Lys Leu Ser Asp Ser Lys His Val Ala Leu His Asn
115 120 125

Leu Val Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
130 135 140

Asn Asn Leu Lys Arg Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Lys
 145 150 155 160

Leu Ile Ile Asp Leu Ser Ala Gly Ala Glu Asn Asp Ser Ser Tyr Ala
 165 170 175

Leu Gln Asp Ser Glu Ser Thr Asn Gln Val Gln
 180 185

<210> 48
 <211> 184
 <212> PRT
 <213> Avian pneumovirus C

<400> 48

Met Ser Arg Lys Ala Pro Cys Lys Tyr Glu Val Arg Gly Lys Cys Asn
 1 5 10 15

Arg Gly Ser Glu Cys Lys Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
 20 25 30

Arg Tyr Leu Leu Leu Arg Ser Asn Tyr Leu Leu Asn Gln Leu Leu Arg
 35 40 45

Asn Thr Asp Arg Ser Asp Gly Leu Ser Leu Ile Ser Gly Ala Gly Arg
 50 55 60

Asp Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
 65 70 75 80

Asn Tyr Ile Asp Asn Asn Glu Asn Ile Thr Lys Ala Ser Thr Cys Tyr
 85 90 95

Ser Leu Tyr Asn Ile Ile Lys Gln Leu Gln Glu Thr Asp Val Arg Gln
 100 105 110

Ala Arg Asp Asn Lys Val Asp Asp Ser Lys His Val Ala Leu His Asn
 115 120 125

Leu Val Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
 130 135 140

Asn Asn Leu Lys Lys Leu Pro Lys Glu Lys Leu Lys Lys Leu Ala Lys
 145 150 155 160

Leu Ile Ile Glu Leu Ser Ala Gly Val Glu Asn Asp Ser Thr Ala Ala
165 170 175

Met Gln Asp Ser Ala Asn Ser Asp
180

<210> 49
<211> 186
<212> PRT
<213> Avian pneumovirus B

<400> 49

Met Ser Gly Arg Asn Pro Cys Arg Tyr Glu Thr Arg Gly Arg Cys Asn
1 5 10 15

Arg Gly Ser Ser Cys Thr Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
20 25 30

His Val Leu Leu Val Arg Ala Asn Tyr Met Leu Asn Gln Leu Val Arg
35 40 45

Asn Thr Asp Arg Thr Asp Gly Leu Ser Leu Ile Ser Gly Ala Gly Arg
50 55 60

Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Ala Asn Val Val Gln
65 70 75 80

Asn Tyr Ile Glu Gly Asn Ala Thr Ile Thr Lys Ser Ala Ala Cys Tyr
85 90 95

Ser Leu Tyr Asn Ile Ile Lys Gln Leu Gln Glu Asn Asp Val Lys Ser
100 105 110

Ala Arg Asp Leu Met Val Asp Asp Pro Lys His Val Ala Leu His Asn
115 120 125

Leu Val Leu Ser Tyr Ile Asp Met Ser Lys Asn Pro Ala Asn Leu Ile
130 135 140

Asn Ser Leu Lys Arg Leu Pro Lys Glu Lys Leu Lys Lys Leu Ala Lys
145 150 155 160

Ile Ile Ile Gln Leu Ser Ala Gly Ser Glu Gly Glu Asn Ala Asn Ser
165 170 175

Asn Thr Leu Gln Lys Gly Asp Ser Ser Asn
180 185

<210> 50
 <211> 186
 <212> PRT
 <213> Turkey rhinotracheitis virus A

<400> 50

Met Ser Arg Arg Asn Pro Cys Arg Tyr Glu Ile Arg Gly Lys Cys Asn
 1 5 10 15

Arg Gly Ser Ser Cys Thr Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
 20 25 30

His Val Leu Leu Val Arg Ala Asn Tyr Met Leu Asn Gln Leu Leu Arg
 35 40 45

Asn Thr Asp Arg Thr Asp Gly Leu Ser Leu Ile Ser Gly Ala Gly Arg
 50 55 60

Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Ala Asn Val Val Gln
 65 70 75 80

Asn Tyr Ile Glu Gly Asn Thr Thr Ile Thr Lys Ser Ala Ala Cys Tyr
 85 90 95

Ser Leu Tyr Asn Ile Ile Lys Gln Leu Gln Glu Asn Asp Val Lys Thr
 100 105 110

Ser Arg Asp Ser Met Leu Glu Asp Pro Lys His Val Ala Leu His Asn
 115 120 125

Leu Ile Leu Ser Tyr Val Asp Met Ser Lys Asn Pro Ala Ser Leu Ile
 130 135 140

Asn Ser Leu Lys Arg Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Lys
 145 150 155 160

Ile Ile Leu Gln Leu Ser Ala Gly Pro Glu Ser Asp Asn Ala Ser Gly
 165 170 175

Asn Thr Leu Gln Lys Gly Asp Ser Asn Asn
 180 185

<210> 51
 <211> 194
 <212> PRT

<213> Human respiratory syncytial virus A

<400> 51

Met Ser Arg Arg Asn Pro Cys Lys Phe Glu Ile Arg Gly His Cys Leu
1 5 10 15

Asn Gly Lys Arg Cys His Phe Ser His Asn Tyr Phe Glu Trp Pro Pro
20 25 30

His Ala Leu Leu Val Arg Gln Asn Phe Met Leu Asn Arg Ile Leu Lys
35 40 45

Ser Met Asp Lys Ser Ile Asp Thr Leu Ser Glu Ile Ser Gly Ala Ala
50 55 60

Glu Leu Asp Arg Thr Glu Glu Tyr Ala Leu Gly Val Val Gly Val Leu
65 70 75 80

Glu Ser Tyr Ile Gly Ser Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys
85 90 95

Val Ala Met Ser Lys Leu Leu Thr Glu Leu Asn Ser Asp Asp Ile Lys
100 105 110

Lys Leu Arg Asp Asn Glu Glu Leu Asn Ser Pro Lys Ile Arg Val Tyr
115 120 125

Asn Thr Val Ile Ser Tyr Ile Glu Ser Asn Arg Lys Asn Asn Lys Gln
130 135 140

Thr Ile His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr
145 150 155 160

Ile Lys Asn Thr Leu Asp Ile His Lys Ser Ile Thr Ile Asn Asn Pro
165 170 175

Lys Glu Ser Thr Val Ser Asp Thr Asn Asp His Ala Lys Asn Asn Asp
180 185 190

Thr Thr

<210> 52

<211> 195

<212> PRT

<213> Human respiratory syncytial virus B

<400> 52

Met Ser Arg Arg Asn Pro Cys Lys Phe Glu Ile Arg Gly His Cys Leu
1 5 10 15

Asn Gly Arg Arg Cys His Tyr Ser His Asn Tyr Phe Glu Trp Pro Pro
20 25 30

His Ala Leu Leu Val Arg Gln Asn Phe Met Leu Asn Lys Ile Leu Lys
35 40 45

Ser Met Asp Lys Ser Ile Asp Thr Leu Ser Glu Ile Ser Gly Ala Ala
50 55 60

Glu Leu Asp Arg Thr Glu Glu Tyr Ala Leu Gly Ile Val Gly Val Leu
65 70 75 80

Glu Ser Tyr Ile Gly Ser Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys
85 90 95

Val Ala Met Ser Lys Leu Leu Ile Glu Ile Asn Ser Asp Asp Ile Lys
100 105 110

Lys Leu Arg Asp Asn Glu Glu Pro Asn Ser Pro Lys Ile Arg Val Tyr
115 120 125

Asn Thr Val Ile Ser Tyr Ile Glu Ser Asn Arg Lys Asn Asn Lys Gln
130 135 140

Thr Ile His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr
145 150 155 160

Ile Lys Asn Thr Leu Asp Ile His Lys Ser Ile Ile Ile Ser Asn Pro
165 170 175

Lys Glu Ser Thr Val Asn Asp Gln Asn Asp Gln Thr Lys Asn Asn Asp
180 185 190

Ile Thr Gly
195

<210> 53

<211> 186

<212> PRT

<213> bovine respiratory syncytial virus

<400> 53

Met Ser Arg Arg Asn Pro Cys Lys Tyr Glu Ile Arg Gly His Cys Leu
1 5 10 15

Asn Gly Lys Lys Cys His Phe Ser His Asn Tyr Phe Glu Trp Pro Pro
20 25 30

His Ala Leu Leu Val Arg Gln Asn Phe Met Leu Asn Lys Ile Leu Lys
35 40 45

Ser Met Asp Arg Asn Asn Asp Thr Leu Ser Glu Ile Ser Gly Ala Ala
50 55 60

Glu Leu Asp Arg Thr Glu Glu Tyr Ala Leu Gly Val Ile Gly Val Leu
65 70 75 80

Glu Ser Tyr Leu Gly Ser Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys
85 90 95

Val Ala Met Ser Lys Leu Leu Ala Glu Ile Asn Asn Asp Asp Ile Lys
100 105 110

Arg Leu Arg Asn Lys Glu Val Pro Thr Ser Pro Lys Ile Arg Ile Tyr
115 120 125

Asn Thr Val Ile Ser Tyr Ile Asp Ser Asn Lys Arg Asn Thr Lys Gln
130 135 140

Thr Ile His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr
145 150 155 160

Ile Lys Asn Thr Ile Asp Ile His Asn Glu Ile Asn Gly Asn Asn Gln
165 170 175

Gly Asp Ile Ile Val Asn Glu Gln Asn Glu
180 185

<210> 54

<211> 176

<212> PRT

<213> Pneumonia virus of mice

<400> 54

Met Ser Val Arg Pro Cys Lys Phe Glu Val Gln Gly Phe Cys Ser Arg
1 5 10 15

Gly Arg Asn Cys Lys Tyr Ser His Lys Tyr Trp Glu Trp Pro Leu Lys
20 25 30

Thr Leu Met Leu Arg Gln Asn Tyr Met Leu Asn Arg Ile Tyr Arg Phe
35 40 45

Leu Asp Thr Asn Thr Asp Ala Ile Ser Asp Val Ser Gly Phe Asp Ala
50 55 60

Pro Gln Arg Thr Ala Glu Tyr Ala Leu Gly Thr Ile Gly Val Leu Lys
65 70 75 80

Ser Tyr Leu Glu Lys Thr Asn Asn Ile Thr Lys Ser Ile Ala Cys Gly
85 90 95

Ser Leu Ile Thr Val Leu Gln Asn Leu Asp Val Gly Leu Val Ile Gln
100 105 110

Ala Arg Asp Ser Asn Thr Glu Asp Thr Asn Tyr Leu Arg Ser Cys Asn
115 120 125

Thr Ile Leu Ser Tyr Ile Asp Lys Ile Leu Lys Lys Arg Gln Ile Ile
130 135 140

His Ile Leu Lys Arg Leu Pro Val Gly Val Leu Cys Asn Leu Ile Gln
145 150 155 160

Ser Val Ile Ser Ile Glu Glu Lys Ile Asn Ser Ser Met Lys Thr Glu
165 170 175

<210> 55
<211> 71
<212> PRT
<213> Human metapneumovirus

<400> 55

Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
1 5 10 15

Ser Glu His Gly Pro Val Phe Ile Thr Ile Glu Val Asp Asp Met Ile
20 25 30

Trp Thr His Lys Asp Leu Lys Glu Ala Leu Ser Asp Gly Ile Val Lys
35 40 45

Ser His Thr Asn Ile Tyr Asn Cys Tyr Leu Glu Asn Ile Glu Ile Ile
50 55 60

Tyr Val Lys Ala Tyr Leu Ser
65 70

<210> 56
<211> 71
<212> PRT
<213> Avian pneumovirus C

<400> 56

Met Thr Leu Gln Leu Pro Cys Lys Ile Val Gln Thr Leu Ile Lys Cys
1 5 10 15

Gly Glu His Gly Leu Ile Phe Leu Lys Met Lys Leu Asp Asp Met Val
20 25 30

Trp Thr Lys Asn Glu Leu Val Asp Ile Ile Ser Thr Glu Ile Val Lys
35 40 45

Val His Ala Asn Ile Phe Lys Cys Arg Leu Glu Asp Ile Glu Ile Ile
50 55 60

Tyr Val Lys Thr Phe Leu Ser
65 70

<210> 57
<211> 73
<212> PRT
<213> Avian pneumovirus B

<400> 57

Met Pro Ile Val Ile Pro Cys Lys Arg Val Thr Ala Val Ile Arg Cys
1 5 10 15

Asn Thr Leu Gly Val Cys Leu Phe Lys Arg Thr Tyr Glu His Asn Ile
20 25 30

Ile Asn Leu Gly Asp Leu Ile Glu Glu Val Ala Arg Met Ile Ile Ile
35 40 45

Asp His Ile Asn Arg Lys Gln Cys Asn Glu Cys Arg Lys Asp Phe Glu
50 55 60

Phe Val Ala Val Tyr Thr Ser Tyr Thr
65 70

<210> 58
 <211> 73
 <212> PRT
 <213> Turkey rhinotracheitis virus A

<400> 58

Met Pro Val Val Ile Pro Cys Arg Arg Val Thr Ala Ile Ile Lys Cys
 1 5 10 15

Asn Ala Leu Gly Leu Cys Met Val Arg Lys Ile Tyr Asp Tyr Ser Ile
 20 25 30

Ala Ser Trp Ser Asp Leu Ile Glu Glu Val Ala Asn Met Val Leu Ile
 35 40 45

Asp His Ile Asn Arg Lys Gln Cys Val Glu Cys Arg Lys Asp Phe Glu
 50 55 60

Phe Ile Ala Ile Tyr Thr Ser Tyr Asn
 65 70

<210> 59
 <211> 90
 <212> PRT
 <213> Human respiratory syncytial virus A

<400> 59

Met Thr Met Pro Lys Ile Met Ile Leu Pro Asp Lys Tyr Pro Cys Ser
 1 5 10 15

Ile Thr Ser Ile Leu Ile Thr Ser Arg Cys Arg Val Thr Met Tyr Asn
 20 25 30

Gln Lys Asn Thr Leu Tyr Phe Asn Gln Asn Asn Pro Asn Asn His Met
 35 40 45

Tyr Ser Pro Asn Gln Thr Phe Asn Glu Ile His Trp Thr Ser Gln Glu
 50 55 60

Leu Ile Asp Thr Ile Gln Asn Phe Leu Gln His Leu Gly Ile Ile Glu
 65 70 75 80

Asp Ile Tyr Thr Ile Tyr Ile Leu Val Ser
 85 90

<210> 60
 <211> 90
 <212> PRT

<213> Human respiratory syncytial virus B

<400> 60

Met Thr Lys Pro Lys Ile Met Ile Leu Pro Asp Lys Tyr Pro Cys Ser
1 5 10 15

Ile Ser Ser Ile Leu Ile Ser Ser Glu Ser Met Ile Ala Thr Phe Asn
20 25 30

His Lys Asn Ile Leu Gln Phe Asn His Asn His Leu Asp Asn His Gln
35 40 45

Arg Leu Leu Asn Asn Ile Phe Asp Glu Ile His Trp Thr Pro Lys Asn
50 55 60

Leu Leu Asp Ala Thr Gln Gln Phe Leu Gln His Leu Asn Ile Pro Glu
65 70 75 80

Asp Ile Tyr Thr Ile Tyr Ile Leu Val Ser
85 90

<210> 61

<211> 90

<212> PRT

<213> Bovine respiratory syncytial virus

<400> 61

Met Asn Asn Ser Asn Ile Ile Ile Phe Pro Glu Lys Tyr Pro Cys Ser
1 5 10 15

Ile Ser Ser Leu Leu Ile Lys Asn Glu Asn Asp Val Ile Val Leu Ser
20 25 30

His Gln Asn Val Leu Asp Tyr Leu Gln Phe Gln Tyr Pro Cys Asn Met
35 40 45

Tyr Ser Gln Asn His Met Leu Asp Asp Ile Tyr Trp Thr Ser Gln Glu
50 55 60

Leu Ile Glu Asp Val Leu Lys Ile Leu His Leu Ser Gly Ile Ser Ile
65 70 75 80

Ser Lys Tyr Val Ile Tyr Val Leu Val Leu
85 90

<210> 62

<211> 97

<212> PRT
<213> Pneumonia virus of mice

<400> 62

Met Gln Ser Asp Pro Ile Cys His Leu His Arg Gly Glu Asp Lys Phe
1 5 10 15

Phe Tyr Glu Asn Arg Met Ile Arg Leu Pro Lys Tyr Tyr Pro Ala Ile
20 25 30

Leu His Lys Met Tyr Ile Ile Arg Val Asn Arg Asn Thr Tyr Asp Gly
35 40 45

Ser Gly Pro Ser Thr Ile Ile Asp Ala Gly Lys Ser Val Val Trp Asn
50 55 60

Arg Val Asp Val Ile Ala Cys Val Lys Glu Ala Leu Cys Cys Ile Glu
65 70 75 80

Phe Ser Trp Asn Asn Gln Val Ile Ile Asp Phe Asp Tyr Ser Gln Ala
85 90 95

Arg

<210> 63
<211> 183
<212> PRT
<213> Human metapneumovirus

<400> 63

Met Ile Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Lys Thr Cys
1 5 10 15

Thr His Leu Lys Lys Ile Ile Lys Asp His Ser Gly Lys Val Leu Ile
20 25 30

Val Leu Lys Leu Ile Leu Ala Leu Leu Thr Phe Leu Thr Val Thr Ile
35 40 45

Thr Ile Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ile Cys Gln Ser
50 55 60

Lys Thr Glu Ser Asp Lys Lys Asp Ser Ser Ser Asn Thr Thr Ser Val
65 70 75 80

Thr Thr Lys Thr Thr Leu Asn His Asp Ile Thr Gln Tyr Phe Lys Ser
85 90 95

Leu Ile Gln Arg Tyr Thr Asn Ser Ala Ile Asn Ser Asp Thr Cys Trp
100 105 110

Lys Ile Asn Arg Asn Gln Cys Thr Asn Ile Thr Thr Tyr Lys Phe Leu
115 120 125

Cys Phe Lys Ser Glu Asp Thr Lys Thr Asn Asn Cys Asp Lys Leu Thr
130 135 140

Asp Leu Cys Arg Asn Lys Pro Lys Pro Ala Val Gly Val Tyr His Ile
145 150 155 160

Val Glu Cys His Cys Ile Tyr Thr Val Lys Trp Lys Cys Tyr His Tyr
165 170 175

Pro Thr Asp Glu Thr Gln Ser
180

<210> 64

<211> 236

<212> PRT

<213> Human metapneumovirus

<400> 64

Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
1 5 10 15

Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
20 25 30

Leu Val Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
35 40 45

Leu Ile Ile Asn Tyr Lys Met Gln Lys Asn Thr Ser Glu Ser Glu His
50 55 60

His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
65 70 75 80

Pro Thr Asp Asn Ser Asp Thr Asn Ser Ser Pro Gln His Pro Thr Gln
85 90 95

Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
100 105 110

Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Asn Arg Pro Pro
115 120 125

Phe Val Asp Thr His Thr Thr Pro Pro Ser Ala Ser Arg Thr Lys Thr
130 135 140

Ser Pro Ala Val His Thr Lys Asn Asn Pro Arg Thr Ser Ser Arg Thr
145 150 155 160

His Ser Pro Pro Arg Ala Thr Thr Arg Thr Ala Arg Arg Thr Thr Thr
165 170 175

Leu Arg Thr Ser Ser Thr Arg Lys Arg Pro Ser Thr Ala Ser Val Gln
180 185 190

Pro Asp Ile Ser Ala Thr Thr His Lys Asn Glu Glu Ala Ser Pro Ala
195 200 205

Ser Pro Gln Thr Ser Ala Ser Thr Thr Arg Ile Gln Arg Lys Ser Val
210 215 220

Glu Ala Asn Thr Ser Thr Thr Tyr Asn Gln Thr Ser
225 230 235

<210> 65
<211> 223
<212> PRT
<213> Human metapneumovirus

<400> 65

Asn Tyr Ile Ala Arg Ala Ser Ile Val Thr Asp Leu Ser Lys Phe Asn
1 5 10 15

Gln Ala Phe Arg Tyr Glu Thr Thr Ala Ile Cys Ala Asp Val Ala Asp
20 25 30

Glu Leu His Gly Thr Gln Ser Leu Phe Cys Trp Leu His Leu Ile Val
35 40 45

Pro Met Thr Thr Met Ile Cys Ala Tyr Arg His Ala Pro Pro Glu Thr
50 55 60

Lys Gly Glu Tyr Asp Ile Asp Lys Ile Glu Glu Gln Ser Gly Leu Tyr
65 70 75 80

Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp Thr
85 90 95

Met Glu Ala Ile Ser Leu Leu Asp Val Val Ser Val Lys Thr Arg Cys
100 105 110

Gln Met Thr Ser Leu Leu Asn Gly Asp Asn Gln Ser Ile Asp Val Ser
115 120 125

Lys Pro Val Lys Leu Ser Glu Gly Leu Asp Glu Val Lys Ala Asp Tyr
130 135 140

Ser Leu Ala Val Lys Met Leu Lys Glu Ile Arg Asp Ala Tyr Arg Asn
145 150 155 160

Ile Gly His Lys Leu Lys Glu Gly Glu Thr Tyr Ile Ser Arg Asp Leu
165 170 175

Gln Phe Ile Ser Lys Val Ile Gln Ser Glu Gly Val Met His Pro Thr
180 185 190

Pro Ile Lys Lys Ile Leu Arg Val Gly Pro Trp Ile Asn Thr Ile Leu
195 200 205

Asp Asp Ile Lys Thr Ser Ala Glu Ser Ile Gly Ser Leu Cys Gln
210 215 220

<210> 66
<211> 223
<212> PRT
<213> Avian pneumovirus A

<400> 66

Asn Tyr Ile Ala Arg Ala Ser Ile Val Thr Asp Leu Ser Lys Phe Asn
1 5 10 15

Gln Ala Phe Arg Tyr Glu Thr Thr Ser Val Cys Ala Asp Val Ala Asp
20 25 30

Glu Leu His Gly Thr Gln Ser Leu Phe Cys Trp Leu His Leu Thr Val
35 40 45

Ser Ser Thr Thr Met Ile Cys Thr Tyr Arg His Ala Pro Pro Asp Thr
50 55 60

Gly Gly Ile Tyr Asp Ile Asp Gln Ile Pro Glu Gln Ser Gly Leu Tyr
65 70 75 80

Arg Phe His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Met Trp Thr
85 90 95

Met Glu Ala Ile Ser Leu Leu Asp Val Val Ser Val Arg Asn Arg Val
100 105 110

Gln Leu Thr Ser Leu Leu Asn Gly Asp Asn Gln Ser Ile Asp Val Ser
115 120 125

Lys Pro Val Arg Leu Thr Gly Ala Gln Thr Glu Ile Gln Ala Asp Tyr
130 135 140

Ser Leu Ala Ile Lys Met Leu Thr Ala Val Arg Asp Ala Tyr Tyr Asn
145 150 155 160

Ile Gly His Lys Leu Lys Glu Gly Glu Thr Tyr Val Ser Arg Asp Leu
165 170 175

Gln Phe Met Ser Lys Thr Ile Gln Ser Glu Gly Val Met Tyr Pro Ala
180 185 190

Ala Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile Leu
195 200 205

Asp Asp Ile Lys Thr Ser Met Glu Ala Ile Gly Ser Leu Cys Gln
210 215 220

<210> 67

<211> 224

<212> PRT

<213> Human respiratory syncytial virus A

<400> 67

Asn Tyr Ile Ser Lys Cys Ser Ile Ile Thr Asp Leu Ser Lys Phe Asn
1 5 10 15

Gln Ala Phe Arg Tyr Glu Thr Ser Cys Ile Cys Ser Asp Val Leu Asp
20 25 30

Glu Leu His Gly Val Gln Ser Leu Phe Phe Trp Leu His Leu Ala Ile
35 40 45

Pro His Val Thr Ile Ile Cys Thr Tyr Arg His Ala Pro Pro Tyr Ile
50 55 60

Arg Asp His Ile Val Asp Leu Asn Asn Val Asp Glu Gln Ser Gly Leu
65 70 75 80

Tyr Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp
85 90 95

Thr Ile Glu Ala Ile Ser Leu Leu Asp Leu Ile Ser Leu Lys Gly Lys
100 105 110

Phe Ser Ile Thr Ala Leu Ile Asn Gly Asp Asn Gln Ser Ile Asp Ile
115 120 125

Ser Lys Pro Val Arg Leu Met Glu Gly Gln Thr His Ala Gln Ala Asp
130 135 140

Tyr Leu Leu Ala Leu Asn Ser Leu Lys Leu Leu Tyr Lys Glu Tyr Ala
145 150 155 160

Gly Ile Gly His Lys Leu Lys Gly Thr Glu Thr Tyr Ile Ser Arg Asp
165 170 175

Met Gln Phe Met Ser Lys Thr Ile Gln His Asn Gly Val Tyr Tyr Pro
180 185 190

Ala Ser Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile
195 200 205

Leu Asp Asp Phe Lys Val Ser Leu Glu Ser Ile Gly Ser Leu Thr Gln
210 215 220

<210> 68
<211> 224
<212> PRT
<213> Human respiratory syncytial virus B

<400> 68

Asn Tyr Ile Ser Lys Cys Ser Ile Ile Thr Asp Leu Ser Lys Phe Asn
1 5 10 15

Gln Ala Phe Arg Tyr Glu Thr Ser Cys Ile Cys Ser Asp Val Leu Asp
20 25 30

Glu Leu His Gly Val Gln Ser Leu Phe Ser Trp Leu His Leu Thr Ile
35 40 45

Pro Leu Val Thr Ile Ile Cys Thr Tyr Arg His Ala Pro Pro Phe Ile
 50 55 60

Lys Asp His Val Val Asn Leu Asn Glu Val Asp Glu Gln Ser Gly Leu
 65 70 75 80

Tyr Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp
 85 90 95

Thr Ile Glu Ala Ile Ser Leu Leu Asp Leu Ile Ser Leu Lys Gly Lys
 100 105 110

Phe Ser Ile Thr Ala Leu Ile Asn Gly Asp Asn Gln Ser Ile Asp Ile
 115 120 125

Ser Lys Pro Val Arg Leu Ile Glu Gly Gln Thr His Ala Gln Ala Asp
 130 135 140

Tyr Leu Leu Ala Leu Asn Ser Leu Lys Leu Leu Tyr Lys Glu Tyr Ala
 145 150 155 160

Gly Ile Gly His Lys Leu Lys Gly Thr Glu Thr Tyr Ile Ser Arg Asp
 165 170 175

Met Gln Phe Met Ser Lys Thr Ile Gln His Asn Gly Val Tyr Tyr Pro
 180 185 190

Ala Ser Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile
 195 200 205

Leu Asp Asp Phe Lys Val Ser Leu Glu Ser Ile Gly Ser Leu Thr Gln
 210 215 220

<210> 69
 <211> 224
 <212> PRT
 <213> bovine respiratory syncytial virus

<400> 69

Asn Tyr Ile Ser Lys Cys Ser Ile Ile Thr Asp Leu Ser Lys Phe Asn
 1 5 10 15

Gln Ala Phe Arg Tyr Glu Thr Ser Cys Ile Cys Ser Asp Val Leu Asp
 20 25 30

Glu Leu His Gly Val Gln Ser Leu Phe Ser Trp Leu His Leu Thr Ile
 35 40 45

Pro Phe Ala Thr Val Ile Cys Thr Tyr Arg His Ala Pro Pro Tyr Ile
50 55 60

Arg Asn His Ile Thr Asp Leu Asn Lys Val Asp Glu Gln Ser Gly Leu
65 70 75 80

Tyr Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp
85 90 95

Thr Ile Glu Ala Ile Ser Leu Leu Asp Leu Ile Ser Ile Lys Gly Lys
100 105 110

Phe Ser Ile Thr Ala Leu Ile Asn Gly Asp Asn Gln Ser Ile Asp Ile
115 120 125

Ser Lys Pro Ile Lys Leu Asn Glu Gly Gln Thr His Ala Gln Ala Asp
130 135 140

Tyr Leu Leu Ala Leu Lys Ser Leu Lys Leu Leu Tyr Lys Glu Tyr Ala
145 150 155 160

Ser Ile Gly His Lys Leu Lys Gly Thr Glu Thr Tyr Ile Ser Arg Asp
165 170 175

Met Gln Phe Met Ser Lys Thr Ile Gln His Asn Gly Val Tyr Tyr Pro
180 185 190

Ala Ser Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile
195 200 205

Leu Asp Asp Phe Lys Val Ser Met Glu Ser Ile Gly Ser Leu Thr Gln
210 215 220

<210> 70

<211> 223

<212> PRT

<213> Human parainfluenza virus 2

<400> 70

Phe Glu Leu Ser Ala Cys Phe Ile Thr Thr Asp Leu Ala Lys Tyr Cys
1 5 10 15

Leu Gln Trp Arg Tyr Gln Thr Ile Ile His Phe Ala Arg Thr Leu Asn
20 25 30

Arg Met Tyr Gly Val Pro His Leu Phe Glu Trp Ile His Leu Arg Leu
 35 40 45

Ile Arg Ser Thr Leu Tyr Val Gly Asp Pro Phe Asn Pro Pro Ala Ala
 50 55 60

Thr Asp Ala Phe Asp Leu Asp Lys Val Leu Asn Gly Asp Ile Phe Ile
 65 70 75 80

Val Ser Lys Gly Gly Ile Glu Gly Leu Cys Gln Lys Met Trp Thr Met
 85 90 95

Ile Ser Ile Ser Val Ile Ile Leu Ser Ser Ala Glu Ser Lys Thr Arg
 100 105 110

Val Met Ser Met Val Gln Gly Asp Asn Gln Ala Ile Ala Val Thr Thr
 115 120 125

Arg Val Pro Arg Ser Leu Pro Ser Ile Gln Lys Lys Glu Leu Ala Tyr
 130 135 140

Ala Ala Ser Lys Leu Phe Phe Glu Arg Leu Arg Ala Asn Asn Tyr Gly
 145 150 155 160

Leu Gly His Gln Leu Lys Ala Gln Glu Thr Ile Ile Ser Ser Thr Phe
 165 170 175

Phe Ile Tyr Ser Lys Arg Val Phe Tyr Gln Gly Arg Ile Leu Thr Gln
 180 185 190

Ala Leu Lys Asn Ala Ser Lys Leu Cys Leu Thr Ala Asp Val Leu Gly
 195 200 205

Glu Cys Thr Gln Ala Ser Cys Ser Asn Ser Ala Thr Thr Ile Met
 210 215 220

<210> 71
 <211> 224
 <212> PRT
 <213> Newcastle disease virus

<400> 71

Arg Arg Arg Val Ala Thr Phe Ile Thr Thr Asp Leu Gln Lys Tyr Cys
 1 5 10 15

Leu Asn Trp Arg Tyr Gln Thr Ile Lys Leu Phe Ala His Ala Ile Asn
 20 25 30

Gln Leu Met Gly Leu Pro His Phe Phe Glu Trp Ile His Leu Arg Leu
 35 40 45

Met Asp Thr Thr Met Phe Val Gly Asp Pro Phe Asn Pro Pro Ser Asp
 50 55 60

Pro Thr Asp Cys Asp Leu Ser Arg Val Pro Asn Asp Asp Ile Tyr Ile
 65 70 75 80

Val Ser Ala Arg Gly Gly Ile Glu Gly Leu Cys Gln Lys Leu Trp Thr
 85 90 95

Met Ile Ser Ile Ala Ala Ile Gln Leu Ala Ala Ala Arg Ser His Cys
 100 105 110

Arg Val Ala Cys Met Val Gln Gly Asp Asn Gln Val Ile Ala Val Thr
 115 120 125

Arg Glu Val Arg Ser Asp Asp Ser Pro Glu Met Val Leu Thr Gln Leu
 130 135 140

His Gln Ala Ser Asp Asn Phe Phe Lys Glu Leu Ile His Val Asn His
 145 150 155 160

Leu Ile Gly His Asn Leu Lys Asp Arg Glu Thr Ile Arg Ser Asp Thr
 165 170 175

Phe Phe Ile Tyr Ser Lys Arg Ile Phe Lys Asp Gly Ala Ile Leu Ser
 180 185 190

Gln Val Leu Lys Asn Ser Ser Lys Leu Val Leu Val Ser Gly Asp Leu
 195 200 205

Ser Glu Asn Thr Val Met Ser Cys Ala Asn Ile Ala Ser Thr Val Ala
 210 215 220

<210> 72
 <211> 224
 <212> PRT
 <213> Sendai virus

<400> 72

Tyr Glu Thr Leu Ser Cys Phe Leu Thr Thr Asp Leu Lys Lys Tyr Cys
 1 5 10 15

Leu Asn Trp Arg Phe Glu Ser Thr Ala Leu Phe Gly Gln Arg Cys Asn
20 25 30

Glu Ile Phe Gly Phe Lys Thr Phe Phe Asn Trp Met His Pro Val Leu
35 40 45

Glu Lys Cys Thr Ile Tyr Val Gly Asp Pro Tyr Cys Pro Val Ala Asp
50 55 60

Arg Met His Arg Gln Leu Gln Asp His Ala Asp Ser Gly Ile Phe Ile
65 70 75 80

His Asn Pro Arg Gly Gly Ile Glu Gly Tyr Cys Gln Lys Leu Trp Thr
85 90 95

Leu Ile Ser Ile Ser Ala Ile His Leu Ala Ala Val Arg Val Gly Val
100 105 110

Arg Val Ser Ala Met Val Gln Gly Asp Asn Gln Ala Ile Ala Val Thr
115 120 125

Ser Arg Val Pro Val Ala Gln Thr Tyr Lys Gln Lys Lys Asn His Val
130 135 140

Tyr Glu Glu Ile Thr Arg Tyr Phe Gly Ala Leu Arg His Val Met Phe
145 150 155 160

Asp Ile Gly His Glu Leu Lys Leu Asn Glu Thr Ile Ile Ser Ser Lys
165 170 175

Met Phe Val Tyr Ser Lys Arg Ile Tyr Tyr Asp Gly Lys Ile Leu Pro
180 185 190

Gln Cys Leu Lys Ala Leu Thr Arg Cys Val Phe Trp Ser Glu Thr Leu
195 200 205

Val Asp Glu Asn Arg Ser Ala Cys Ser Asn Ile Ser Thr Ser Ile Ala
210 215 220

<210> 73

<211> 224

<212> PRT

<213> Human parainfluenza virus 3

<400> 73

Tyr Glu Thr Val Ser Cys Phe Leu Thr Thr Asp Leu Lys Lys Tyr Cys
1 5 10 15

Leu Asn Trp Arg Tyr Glu Ser Thr Ala Leu Phe Gly Glu Thr Cys Asn
20 25 30

Gln Ile Phe Gly Leu Asn Lys Leu Phe Asn Trp Leu His Pro Arg Leu
35 40 45

Glu Gly Ser Thr Ile Tyr Val Gly Asp Pro Tyr Cys Pro Pro Ser Asp
50 55 60

Lys Glu His Ile Ser Leu Glu Asp His Pro Asp Ser Gly Phe Tyr Val
65 70 75 80

His Asn Pro Arg Gly Gly Ile Glu Gly Phe Cys Gln Lys Leu Trp Thr
85 90 95

Leu Ile Ser Ile Ser Ala Ile His Leu Ala Ala Val Arg Ile Gly Val
100 105 110

Arg Val Thr Ala Met Val Gln Gly Asp Asn Gln Ala Ile Ala Val Thr
115 120 125

Thr Arg Val Pro Asn Asn Tyr Asp Tyr Arg Ile Lys Lys Glu Ile Val
130 135 140

Tyr Lys Asp Val Val Arg Phe Phe Asp Ser Leu Arg Glu Val Met Asp
145 150 155 160

Asp Leu Gly His Glu Leu Lys Leu Asn Glu Thr Ile Ile Ser Ser Lys
165 170 175

Met Phe Ile Tyr Ser Lys Arg Ile Tyr Tyr Asp Gly Arg Ile Leu Pro
180 185 190

Gln Ala Leu Lys Ala Leu Ser Arg Cys Val Phe Trp Ser Glu Thr Val
195 200 205

Ile Asp Glu Thr Arg Ser Ala Ser Ser Asn Leu Ala Thr Ser Phe Ala
210 215 220

<210> 74

<211> 224

<212> PRT

<213> Measles virus

<400> 74

Tyr Glu Thr Val Ser Ala Phe Ile Thr Thr Asp Leu Lys Lys Tyr Cys
1 5 10 15

Leu Asn Trp Arg Tyr Glu Thr Ile Ser Leu Phe Ala Gln Arg Leu Asn
20 25 30

Glu Ile Tyr Gly Leu Pro Ser Phe Phe Gln Trp Leu His Lys Arg Leu
35 40 45

Glu Thr Ser Val Leu Tyr Val Ser Asp Pro His Cys Pro Pro Asp Leu
50 55 60

Asp Ala His Ile Pro Leu Tyr Lys Val Pro Asn Asp Gln Ile Phe Ile
65 70 75 80

Lys Tyr Pro Met Gly Gly Ile Glu Gly Tyr Cys Gln Lys Leu Trp Thr
85 90 95

Ile Ser Thr Ile Pro Tyr Leu Tyr Leu Ala Ala Tyr Glu Ser Gly Val
100 105 110

Arg Ile Ala Ser Leu Val Gln Gly Asp Asn Gln Thr Ile Ala Val Thr
115 120 125

Lys Arg Val Pro Ser Thr Trp Pro Tyr Asn Leu Lys Lys Arg Glu Ala
130 135 140

Ala Arg Val Thr Arg Asp Tyr Phe Val Ile Leu Arg Gln Arg Leu His
145 150 155 160

Asp Ile Gly His His Leu Lys Ala Asn Glu Thr Ile Val Ser Ser His
165 170 175

Phe Phe Val Tyr Ser Lys Gly Ile Tyr Tyr Asp Gly Leu Leu Val Ser
180 185 190

Gln Ser Leu Lys Ser Ile Ala Arg Cys Val Phe Trp Ser Glu Thr Ile
195 200 205

Val Asp Glu Thr Arg Ala Ala Cys Ser Asn Ile Ala Thr Thr Met Ala
210 215 220

<210> 75

<211> 224
 <212> PRT
 <213> Nipah virus

<400> 75

Phe Asp Thr Val Ser Ala Phe Leu Thr Thr Asp Leu Lys Lys Phe Cys
 1 5 10 15

Leu Asn Trp Arg Tyr Glu Ser Met Ala Ile Phe Ala Glu Arg Leu Asp
 20 25 30

Glu Ile Tyr Gly Leu Pro Gly Phe Phe Asn Trp Met His Lys Arg Leu
 35 40 45

Glu Arg Ser Val Ile Tyr Val Ala Asp Pro Asn Cys Pro Pro Asn Ile
 50 55 60

Asp Lys His Met Glu Leu Glu Lys Thr Pro Glu Asp Asp Ile Phe Ile
 65 70 75 80

His Tyr Pro Lys Gly Gly Ile Glu Gly Tyr Ser Gln Lys Thr Trp Thr
 85 90 95

Ile Ala Thr Ile Pro Phe Leu Phe Leu Ser Ala Tyr Glu Thr Asn Thr
 100 105 110

Arg Ile Ala Ala Ile Val Gln Gly Asp Asn Glu Ser Ile Ala Ile Thr
 115 120 125

Gln Lys Val His Pro Asn Leu Pro Tyr Lys Val Lys Lys Glu Ile Cys
 130 135 140

Ala Lys Gln Ala Gln Leu Tyr Phe Glu Arg Leu Arg Met Asn Leu Arg
 145 150 155 160

Ala Leu Gly His Asn Leu Lys Ala Thr Glu Thr Ile Ile Ser Thr His
 165 170 175

Leu Phe Ile Tyr Ser Lys Lys Ile His Tyr Asp Gly Ala Val Leu Ser
 180 185 190

Gln Ala Leu Lys Ser Met Ser Arg Cys Cys Phe Trp Ser Glu Thr Leu
 195 200 205

Val Asp Glu Thr Arg Ser Ala Cys Ser Asn Ile Ser Thr Thr Ile Ala
 210 215 220

<210> 76
 <211> 57
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 76
 acgagaaaaa aacgcguaua aaauagauuc caaaaaaaua ugggacaagu gaaaaug 57

 <210> 77
 <211> 29
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 77
 uaauuaaaaa agugggacaa gucaaaaug 29

 <210> 78
 <211> 38
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 78
 uaguuaaaua aaaauaaaca augggacaag uaaaaaug 38

 <210> 79
 <211> 128
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 79
 uaacaaccaa gcaccuuggc caagagcuac uaaccucauc ucauagauca uaaagucacc 60
 auucuaguua uauaaaaauc aaguuagaac aagaauuaaa ucaaucaaga acgggacaaa 120
 uaaaaaug 128

 <210> 80
 <211> 71
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 80
 uaguuaauua aaaauaaagu aaauuaaaau aaauuaaaau uaaaaauaaa aaauugggac 60
 aaaucauaau g 71

 <210> 81
 <211> 36
 <212> RNA
 <213> Human metapneumovirus

 <400> 81
 uaguaaaaac acaucagagu gggauaaaug acaaug 36

<210> 82
 <211> 207
 <212> RNA
 <213> Human metapneumovirus 00-1

<400> 82
 uaaauguuaa caccagauua ggauccaucc aagucuguua guucaacaau uuaguuaauuu 60
 aaaaauauuu ugaaaacaag uaaguuuuua ugauacuua uaauaauaag uaauaauuaa 120
 uugcuuaaau aucaucacaa cauuauucga aaccuaaacu auucaauuaa aaaaguaaaa 180
 aacaauaaca ugggacaagu aguuaug 207

<210> 83
 <211> 215
 <212> RNA
 <213> Human metapneumovirus 00-1

<400> 83
 uaacaaaaaa uacaaaauaa cucuaagaua aaccaugcag acaccaaca uggagaagcc 60
 aaaagacaau ucacaaucuc cccaaaaagg caacaacacc auauuagcuc ugcccaaauc 120
 ucccuggaaa aaacacucgc ccuuuuacca aaauuaccac aaccacccca agaaaaaaac 180
 ugggcaaaaac aacacccaag agacaaaaua caaug 215

<210> 84
 <211> 182
 <212> RNA
 <213> Human metapneumovirus 00-1

<400> 84
 ugaaaaauga uaaaaaugau aaaauaggug acaacuucac acuaauccaa aguaaucauu 60
 ugauuaugca auuauguaau aguuaauuaa aaacuaaaaa ucaaaaguua gaaacuaaca 120
 acugucauuu aguuuauuaa aaauaagaaa uuauaaugg auguauacgg uuuuuuucuc 180
 gu 182

<210> 85
 <211> 45
 <212> RNA
 <213> Human metapneumovirus 00-1

<400> 85
 ucccauauuu uuuuggaauc uaauuuauac gcguuuuuuu cucgu 45

<210> 86
 <211> 44
 <212> RNA
 <213> Human metapneumovirus 00-1

<400> 86
 acgagaaaaa aaccguauac auccaauuau aaauucuuau uuuu 44

<210> 87
 <211> 45
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 87
 acgagaaaaa aaccguauac auccaauuau aauuucuuau uuuua 45

<210> 88
 <211> 45
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 88
 acgagaaaaa aaccguauuc aucaaaauuu uagcuuuuag uuuuu 45

<210> 89
 <211> 44
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 89
 cccaauuuuu uuuggaauuc aauuuauacg cguuuuuuuc ucgu 44

<210> 90
 <211> 44
 <212> RNA
 <213> Human metapneumovirus 00-1

 <400> 90
 cccaauuuuu uucuagaacc ugcuugaaug cguuuuuuuc ucgu 44

<210> 91
 <211> 394
 <212> PRT
 <213> Human metapneumovirus 99-1

 <400> 91

Met Ser Leu Gln Gly Ile His Leu Ser Asp Leu Ser Tyr Lys His Ala
 1 5 10 15

Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg Asp Val Gly Thr Thr
 20 25 30

Thr Ala Val Thr Pro Ser Ser Leu Gln Gln Glu Ile Thr Leu Leu Cys
 35 40 45

Gly Glu Ile Leu Tyr Thr Lys His Thr Asp Tyr Lys Tyr Ala Ala Glu
 50 55 60

Ile	Gly	Ile	Gln	Tyr	Ile	Cys	Thr	Ala	Leu	Gly	Ser	Glu	Arg	Val	Gln	
65					70					75					80	
Gln	Ile	Leu	Arg	Asn	Ser	Gly	Ser	Glu	Val	Gln	Val	Val	Leu	Thr	Lys	
				85					90					95		
Thr	Tyr	Ser	Leu	Gly	Lys	Gly	Lys	Asn	Ser	Lys	Gly	Glu	Glu	Leu	Gln	
			100					105					110			
Met	Leu	Asp	Ile	His	Gly	Val	Glu	Lys	Ser	Trp	Ile	Glu	Glu	Ile	Asp	
		115					120					125				
Lys	Glu	Ala	Arg	Lys	Thr	Met	Val	Thr	Leu	Leu	Lys	Glu	Ser	Ser	Gly	
	130					135					140					
Asn	Ile	Pro	Gln	Asn	Gln	Arg	Pro	Ser	Ala	Pro	Asp	Thr	Pro	Ile	Ile	
145					150					155					160	
Leu	Leu	Cys	Val	Gly	Ala	Leu	Ile	Phe	Thr	Lys	Leu	Ala	Ser	Thr	Ile	
				165					170					175		
Glu	Val	Gly	Leu	Glu	Thr	Thr	Val	Arg	Arg	Ala	Asn	Arg	Val	Leu	Ser	
			180					185					190			
Asp	Ala	Leu	Lys	Arg	Tyr	Pro	Arg	Ile	Asp	Ile	Pro	Lys	Ile	Ala	Arg	
		195					200					205				
Ser	Phe	Tyr	Glu	Leu	Phe	Glu	Gln	Lys	Val	Tyr	Tyr	Arg	Ser	Leu	Phe	
	210					215					220					
Ile	Glu	Tyr	Gly	Lys	Ala	Leu	Gly	Ser	Ser	Ser	Thr	Gly	Ser	Lys	Ala	
225					230					235					240	
Glu	Ser	Leu	Phe	Val	Asn	Ile	Phe	Met	Gln	Ala	Tyr	Gly	Ala	Gly	Gln	
				245					250					255		
Thr	Leu	Leu	Arg	Trp	Gly	Val	Ile	Ala	Arg	Ser	Ser	Asn	Asn	Ile	Met	
			260					265					270			
Leu	Gly	His	Val	Ser	Val	Gln	Ser	Glu	Leu	Lys	Gln	Val	Thr	Glu	Val	
		275					280					285				
Tyr	Asp	Leu	Val	Arg	Glu	Met	Gly	Pro	Glu	Ser	Gly	Leu	Leu	His	Leu	
	290					295					300					

Arg Gln Ser Pro Lys Ala Gly Leu Leu Ser Leu Ala Asn Cys Pro Asn
 305 310 315 320

Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly Leu Gly Ile Ile Gly
 325 330 335

Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu Phe Ser Ala Ala Glu
 340 345 350

Ser Tyr Ala Arg Ser Leu Lys Glu Ser Asn Lys Ile Asn Phe Ser Ser
 355 360 365

Leu Gly Leu Thr Asp Glu Glu Lys Glu Ala Ala Glu His Phe Leu Asn
 370 375 380

Met Ser Gly Asp Asn Gln Asp Asp Tyr Glu
 385 390

<210> 92
 <211> 294
 <212> PRT
 <213> Human metapneumovirus 99-1

<400> 92

Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
 1 5 10 15

Ala Lys Ile Ala Glu Ala Phe Gln Lys Ser Leu Lys Lys Ser Gly His
 20 25 30

Lys Arg Thr Gln Ser Ile Val Gly Glu Lys Val Asn Thr Ile Ser Glu
 35 40 45

Thr Leu Glu Leu Pro Thr Ile Ser Lys Pro Ala Arg Ser Ser Thr Leu
 50 55 60

Leu Glu Pro Lys Leu Ala Trp Ala Asp Asn Ser Gly Ile Thr Lys Ile
 65 70 75 80

Thr Glu Lys Pro Ala Thr Lys Thr Thr Asp Pro Val Glu Glu Glu Glu
 85 90 95

Phe Asn Glu Lys Lys Val Leu Pro Ser Ser Asp Gly Lys Thr Pro Ala
 100 105 110

Glu Lys Lys Ser Lys Phe Ser Thr Ser Val Lys Lys Lys Val Ser Phe
 115 120 125

Thr Ser Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu
 130 135 140

Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu
 145 150 155 160

Thr Phe Glu Glu Lys Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu
 165 170 175

Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr
 180 185 190

Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
 195 200 205

Asp Ala Met Ile Gly Ile Arg Glu Glu Leu Ile Ala Glu Ile Ile Lys
 210 215 220

Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Asn Gln
 225 230 235 240

Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
 245 250 255

Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
 260 265 270

Glu Glu Glu Glu Pro Lys Glu Thr Gln Asp Asn Asn Gln Gly Glu Asp
 275 280 285

Ile Tyr Gln Leu Ile Met
 290

<210> 93
 <211> 254
 <212> PRT
 <213> Human metapneumovirus 99-1

<400> 93

Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
 1 5 10 15

Ala Val Gln Val Asp Leu Val Glu Lys Asp Leu Leu Pro Ala Ser Leu
 20 25 30

Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
 35 40 45
 Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60
 Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80
 Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95
 Asp Glu Tyr Ser Lys Leu Asp Phe Asp Lys Leu Thr Val Cys Asp Val
 100 105 110
 Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125
 Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140
 Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Ile Pro Val Thr Ile
 145 150 155 160
 Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175
 Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190
 Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205
 Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220
 Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Arg Ile Cys Lys
 225 230 235 240
 Ser Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
 245 250

<210> 94
 <211> 539
 <212> PRT
 <213> Human metapneumovirus 99-1

<400> 94

Met Ser Trp Lys Val Met Ile Ile Ile Ser Leu Leu Ile Thr Pro Gln
1 5 10 15

His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
20 25 30

Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
35 40 45

Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
50 55 60

Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
65 70 75 80

Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
85 90 95

Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Ile Ala Ile Ala Lys Thr Ile
115 120 125

Arg Leu Glu Ser Glu Val Asn Ala Ile Lys Gly Ala Leu Lys Gln Thr
130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145 150 155 160

Ala Val Arg Glu Leu Lys Glu Phe Val Ser Lys Asn Leu Thr Ser Ala
165 170 175

Ile Asn Arg Asn Lys Cys Asp Ile Ala Asp Leu Lys Met Ala Val Ser
180 185 190

Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195 200 205

Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
210 215 220

Ala Glu Leu Ala Arg Ala Val Ser Tyr Met Pro Thr Ser Ala Gly Gln
225 230 235 240

Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245 250 255

Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln
260 265 270

Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala
275 280 285

Ala Pro Ser Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg
290 295 300

Glu Asp Gln Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr
305 310 315 320

Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp
325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile
340 345 350

Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His
355 360 365

Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
370 375 380

Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Trp Val Gly Ile Ile
385 390 395 400

Lys Gln Leu Pro Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp
405 410 415

Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
420 425 430

Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro
435 440 445

Ile Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450 455 460

Glu Ser Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Lys Ile
465 470 475 480

Leu Asn Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Val Ile
485 490 495

Leu Val Ala Val Leu Gly Leu Thr Met Ile Ser Val Ser Ile Ile Ile
500 505 510

Ile Ile Lys Lys Thr Arg Lys Pro Thr Gly Ala Pro Pro Glu Leu Asn
515 520 525

Gly Val Thr Asn Gly Gly Phe Ile Pro His Ser
530 535

<210> 95

<211> 187

<212> PRT

<213> Human metapneumovirus 99-1

<400> 95

Met Ser Arg Lys Ala Pro Cys Lys Tyr Glu Val Arg Gly Lys Cys Asn
1 5 10 15

Arg Gly Ser Asp Cys Lys Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
20 25 30

Arg Tyr Leu Leu Leu Arg Ser Asn Tyr Leu Leu Asn Gln Leu Leu Arg
35 40 45

Asn Thr Asp Lys Ala Asp Gly Leu Ser Ile Ile Ser Gly Ala Gly Arg
50 55 60

Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
65 70 75 80

Gly Tyr Ile Asp Asp Asn Gln Gly Ile Thr Lys Ala Ala Ala Cys Tyr
85 90 95

Ser Leu His Asn Ile Ile Lys Gln Leu Gln Glu Thr Glu Val Arg Gln
100 105 110

Ala Arg Asp Asn Lys Leu Ser Asp Ser Lys His Val Ala Leu His Asn
115 120 125

Leu Ile Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
130 135 140

Asn Asn Leu Lys Lys Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Arg
 145 150 155 160

Leu Ile Ile Asp Leu Ser Ala Gly Thr Asp Asn Asp Ser Ser Tyr Ala
 165 170 175

Leu Gln Asp Ser Glu Ser Thr Asn Gln Val Gln
 180 185

<210> 96
 <211> 71
 <212> PRT
 <213> Human metapneumovirus 99-1

<400> 96

Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
 1 5 10 15

Ser Lys His Gly Pro Lys Phe Ile Thr Ile Glu Ala Asp Asp Met Ile
 20 25 30

Trp Thr His Lys Glu Leu Lys Glu Thr Leu Ser Asp Gly Ile Val Lys
 35 40 45

Ser His Thr Asn Ile Tyr Ser Cys Tyr Leu Glu Asn Ile Glu Ile Ile
 50 55 60

Tyr Val Lys Thr Tyr Leu Ser
 65 70

<210> 97
 <211> 176
 <212> PRT
 <213> Human metapneumovirus 99-1

<400> 97

Met Lys Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Glu Thr Cys
 1 5 10 15

Asn Gln Leu Lys Lys Ile Ile Lys Lys His Ser Gly Lys Val Leu Ile
 20 25 30

Ala Leu Lys Leu Ile Leu Ala Leu Leu Thr Phe Phe Thr Ala Thr Ile
 35 40 45

Thr Val Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ala Cys Gln Pro
 50 55 60

Lys Asn Glu Ser Asp Lys Lys Val Thr Lys Pro Asn Thr Thr Ser Thr
65 70 75 80

Thr Ile Arg Pro Thr Pro Asp Pro Thr Val Val His His Leu Lys Arg
85 90 95

Leu Ile Gln Arg His Thr Asn Ser Val Thr Lys Asp Ser Asp Thr Cys
100 105 110

Trp Arg Ile His Lys Asn Gln Thr Asn Ile Lys Ile Tyr Lys Phe Leu
115 120 125

Cys Ser Gly Phe Thr Asn Ser Lys Gly Thr Asp Cys Glu Glu Pro Thr
130 135 140

Ala Leu Cys Asp Lys Lys Leu Lys Thr Ile Val Glu Lys His Arg Lys
145 150 155 160

Ala Glu Cys His Cys Leu His Thr Thr Glu Trp Gly Cys Leu His Pro
165 170 175

<210> 98
<211> 224
<212> PRT
<213> Human metapneumovirus 99-1

<400> 98

Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
1 5 10 15

Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
20 25 30

Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
35 40 45

Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
50 55 60

Cys Ala Asn Met Pro Ser Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
65 70 75 80

Ser Thr Ala Gly Pro Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
85 90 95

Trp Thr Thr Glu Asn Ser Thr Ser Pro Val Ala Thr Pro Glu Gly His
 100 105 110

Pro Tyr Thr Gly Thr Thr Gln Thr Ser Asp Thr Thr Ala Pro Gln Gln
 115 120 125

Thr Thr Asp Lys His Thr Ala Pro Leu Lys Ser Thr Asn Glu Gln Ile
 130 135 140

Thr Gln Thr Thr Thr Glu Lys Lys Thr Ile Arg Ala Thr Thr Gln Lys
 145 150 155 160

Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175

Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ser Glu Thr
 180 185 190

Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Thr Thr Thr Gln Ser Ser
 195 200 205

Glu Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser Pro Pro His His Ala
 210 215 220

<210> 99
 <211> 499
 <212> PRT
 <213> Human metapneumovirus 00-1

<400> 99

Met Asp Pro Leu Asn Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser
 1 5 10 15

Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
 20 25 30

Cys Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val
 35 40 45

Ala Ile Glu Asn Pro Val Ile Glu His Val Arg Leu Lys Asn Ala Val
 50 55 60

Asn Ser Lys Met Lys Ile Ser Asp Tyr Lys Ile Val Glu Pro Val Asn
 65 70 75 80

Met Gln His Glu Ile Met Lys Asn Val His Ser Cys Glu Leu Thr Leu
 85 90 95

Leu Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Thr Leu Lys Leu
 100 105 110

Asn Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asp Thr
 115 120 125

Ser Ile Leu Ser Phe Ile Asp Val Glu Phe Ile Pro Ser Trp Val Ser
 130 135 140

Asn Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe
 145 150 155 160

Arg Lys Glu Glu Val Ile Arg Thr Gly Ser Ile Leu Cys Arg Ser Leu
 165 170 175

Gly Lys Leu Val Phe Val Val Ser Ser Tyr Gly Cys Ile Val Lys Ser
 180 185 190

Asn Lys Ser Lys Arg Val Ser Phe Phe Thr Tyr Asn Gln Leu Leu Thr
 195 200 205

Trp Lys Asp Val Met Leu Ser Arg Phe Asn Ala Asn Phe Cys Ile Trp
 210 215 220

Val Ser Asn Ser Leu Asn Glu Asn Gln Glu Gly Leu Gly Leu Arg Ser
 225 230 235 240

Asn Leu Gln Gly Ile Leu Thr Asn Lys Leu Tyr Glu Thr Val Asp Tyr
 245 250 255

Met Leu Ser Leu Cys Cys Asn Glu Gly Phe Ser Leu Val Lys Glu Phe
 260 265 270

Glu Gly Phe Ile Met Ser Glu Ile Leu Arg Ile Thr Glu His Ala Gln
 275 280 285

Phe Ser Thr Arg Phe Arg Asn Thr Leu Leu Asn Gly Leu Thr Asp Gln
 290 295 300

Leu Thr Lys Leu Lys Asn Lys Asn Arg Leu Arg Val His Gly Thr Val
 305 310 315 320

Leu Glu Asn Asn Asp Tyr Pro Met Tyr Glu Val Val Leu Lys Leu Leu
 325 330 335

Gly Asp Thr Leu Arg Cys Ile Lys Leu Leu Ile Asn Lys Asn Leu Glu
 340 345 350

Asn Ala Ala Glu Leu Tyr Tyr Ile Phe Arg Ile Phe Gly His Pro Met
 355 360 365

Val Asp Glu Arg Asp Ala Met Asp Ala Val Lys Leu Asn Asn Glu Ile
 370 375 380

Thr Lys Ile Leu Arg Trp Glu Ser Leu Thr Glu Leu Arg Gly Ala Phe
 385 390 395 400

Ile Leu Arg Ile Ile Lys Gly Phe Val Asp Asn Asn Lys Arg Trp Pro
 405 410 415

Lys Ile Lys Asn Leu Lys Val Leu Ser Lys Arg Trp Thr Met Tyr Phe
 420 425 430

Lys Ala Lys Ser Tyr Pro Ser Gln Leu Glu Leu Ser Glu Gln Asp Phe
 435 440 445

Leu Glu Leu Ala Ala Ile Gln Phe Glu Gln Glu Phe Ser Val Pro Glu
 450 455 460

Lys Thr Asn Leu Glu Met Val Leu Asn Asp Lys Ala Ile Ser Pro Pro
 465 470 475 480

Lys Arg Leu Ile Trp Ser Val Tyr Pro Lys Asn Tyr Leu Pro Glu Lys
 485 490 495

Ile Lys Asn

<210> 100

<211> 499

<212> PRT

<213> Human metapneumovirus 99-1

<400> 100

Met Asp Pro Phe Cys Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser
 1 5 10 15

Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
 20 25 30

Cys Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val
 35 40 45
 Ala Val Glu Asn Pro Val Val Glu His Val Arg Leu Arg Asn Ala Val
 50 55 60
 Met Thr Lys Met Lys Ile Ser Asp Tyr Lys Val Val Glu Pro Val Asn
 65 70 75 80
 Met Gln His Glu Ile Met Lys Asn Ile His Ser Cys Glu Leu Thr Leu
 85 90 95
 Leu Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Ser Leu Lys Leu
 100 105 110
 Asn Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asn Thr
 115 120 125
 Ser Ile Leu Asn Phe Ile Asp Val Glu Phe Ile Pro Val Trp Val Ser
 130 135 140
 Asn Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe
 145 150 155 160
 Arg Arg Glu Glu Val Ile Arg Thr Gly Ser Ile Leu Cys Arg Ser Leu
 165 170 175
 Gly Lys Leu Val Phe Ile Val Ser Ser Tyr Gly Cys Val Val Lys Ser
 180 185 190
 Asn Lys Ser Lys Arg Val Ser Phe Phe Thr Tyr Asn Gln Leu Leu Thr
 195 200 205
 Trp Lys Asp Val Met Leu Ser Arg Phe Asn Ala Asn Phe Cys Ile Trp
 210 215 220
 Val Ser Asn Asn Leu Asn Lys Asn Gln Glu Gly Leu Gly Leu Arg Ser
 225 230 235 240
 Asn Leu Gln Gly Met Leu Thr Asn Lys Leu Tyr Glu Thr Val Asp Tyr
 245 250 255
 Met Leu Ser Leu Cys Cys Asn Glu Gly Phe Ser Leu Val Lys Glu Phe
 260 265 270

Glu Gly Phe Ile Met Ser Glu Ile Leu Lys Ile Thr Glu His Ala Gln
275 280 285

Phe Ser Thr Arg Phe Arg Asn Thr Leu Leu Asn Gly Leu Thr Glu Gln
290 295 300

Leu Ser Val Leu Lys Ala Lys Asn Arg Ser Arg Val Leu Gly Thr Ile
305 310 315 320

Leu Glu Asn Asn Asn Tyr Pro Met Tyr Glu Val Val Leu Lys Leu Leu
325 330 335

Gly Asp Thr Leu Lys Ser Ile Lys Leu Leu Ile Asn Lys Asn Leu Glu
340 345 350

Asn Ala Ala Glu Leu Tyr Tyr Ile Phe Arg Ile Phe Gly His Pro Met
355 360 365

Val Asp Glu Arg Glu Ala Met Asp Ala Val Lys Leu Asn Asn Glu Ile
370 375 380

Thr Lys Ile Leu Lys Leu Glu Ser Leu Thr Glu Leu Arg Gly Ala Phe
385 390 395 400

Ile Leu Arg Ile Ile Lys Gly Phe Val Asp Asn Asn Lys Arg Trp Pro
405 410 415

Lys Ile Lys Asn Leu Lys Val Leu Ser Lys Arg Trp Ala Met Tyr Phe
420 425 430

Lys Ala Lys Ser Tyr Pro Ser Gln Leu Glu Leu Ser Val Gln Asp Phe
435 440 445

Leu Glu Leu Ala Ala Val Gln Phe Glu Gln Glu Phe Ser Val Pro Glu
450 455 460

Lys Thr Asn Leu Glu Met Val Leu Asn Asp Lys Ala Ile Ser Pro Pro
465 470 475 480

Lys Lys Leu Ile Trp Ser Val Tyr Pro Lys Asn Tyr Leu Pro Glu Thr
485 490 495

Ile Lys Asn

<210> 101

<211> 18
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 101
 aagcgaacgc aaggaggc 18

<210> 102
 <211> 18
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 102
 cgaacgcaag gaggcaag 18

<210> 103
 <211> 18
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 103
 acgcaaggag gcaagcga 18

<210> 104
 <211> 18
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 104
 caaggaggca agcgaacg 18

<210> 105
 <211> 49
 <212> PRT
 <213> Human metapneumovirus
 <220>
 <221> misc_feature
 <222> (2)..(22)
 <223> Xaa can be any naturally occurring amino acid
 <220>
 <221> misc_feature

<222> (29)..(48)
<223> Xaa can be any naturally occurring amino acid

<400> 105

Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Gly Glu Gly Ala Gly Asn Xaa Xaa Xaa Xaa
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
35 40 45

Lys

<210> 106
<211> 49

<212> PRT
<213> Human metapneumovirus

<220>
<221> misc_feature
<222> (2)..(23)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (30)..(48)
<223> Xaa can be any naturally occurring amino acid

<400> 106

Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Glu Gly Ala Gly Asn Xaa Xaa Xaa
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
35 40 45

Lys

<210> 107
<211> 24
<212> DNA
<213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 107
 aaagaattca cgagaaaaaa acgc 24

<210> 108
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 108
 ctgtggtctc tagtcccact tc 22

<210> 109
 <211> 18
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 109
 catgcaagct tatggggc 18

<210> 110
 <211> 21
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 110
 cagagtgggtt attgtcaggg t 21

<210> 111
 <211> 19

 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 111
 gtagaactag gagcatatg 19

<210> 112
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 112
 tccccaatgt agatactgct tc 22

<210> 113
 <211> 20
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 113
 gcactcaaga gataccctag 20

<210> 114
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 114
 agactttctg ctttgctgcc tg 22

<210> 115
 <211> 20
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 115
 ccctgacaat aaccactctg 20

<210> 116
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

 <400> 116
 gccaaactgat ttggctgagc tc 22

<210> 117
 <211> 25
 <212> DNA
 <213> artificial

<220>

<223> description of artificial sequence: primer

<400> 117
 tgcactatct cctcttgggg ctttg 25

<210> 118
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 118
 tcaaagctgc ttgacactgg cc 22

<210> 119
 <211> 22
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 119
 catgcccact ataaaaggtc ag 22

<210> 120
 <211> 20
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 120
 caccacagtc tttcttgaaa 20

<210> 121
 <211> 18
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 121
 tgcttgact tcccaaag 18

<210> 122
 <211> 18
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 122	
tatttgaaca aaaagtgt	18
<210> 123	
<211> 19	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	
<400> 123	
tggtgtggga tattaacag	19
<210> 124	
<211> 20	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	
<400> 124	
gcactcaaga gataccctag	20
<210> 125	
<211> 22	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	
<400> 125	
agactttctg ctttgctgcc tg	22
<210> 126	
<211> 20	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	
<400> 126	
ccctgacaat aaccactctg	20
<210> 127	
<211> 22	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	

<400> 127
gccaaactgat ttggctgagc tc 22

<210> 128
<211> 22
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 128
catgcccact ataaaaggtc ag 22

<210> 129
<211> 20
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 129
caccccagtc tttcttgaaa 20

<210> 130
<211> 24
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 130
aaagaattca cgagaaaaaa acgc 24

<210> 131
<211> 22
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 131
ctctggtctc tagtcccact tc 22

<210> 132
<211> 20
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 132
 tgttgtcgag actattccaa 20

<210> 133
 <211> 20
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<220>
 <221> misc_feature
 <222> (6)..(6)
 <223> n is a, c, g, or t

<400> 133
 tgttgnacca gttgcagtct 20

<210> 134
 <211> 23
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<400> 134
 tgctgcttct attgagaaac gcc 23

<210> 135
 <211> 19
 <212> DNA
 <213> artificial

<220>
 <223> description of artificial sequence: primer

<220>
 <221> misc_feature
 <222> (6)..(6)
 <223> n is a, c, g, or t

<220>
 <221> misc_feature
 <222> (9)..(9)
 <223> n is a, c, g, or t

<400> 135
 ggtgantcna atagggcca 19

<210> 136
 <211> 21
 <212> DNA

<213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 136
 ctcgaggttg tcaggatata g 21

<210> 137
 <211> 21
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 137
 ctttgggagt tgaacacagt t 21

<210> 138
 <211> 20
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <220>
 <221> misc_feature
 <222> (4)..(4)
 <223> n is a, c, g, or t
 <400> 138
 ttcngtttta gctgcttacg 20

<210> 139
 <211> 21
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 139
 aggcaaattct ctggataatg c 21

<210> 140
 <211> 18
 <212> DNA
 <213> artificial
 <220>
 <223> description of artificial sequence: primer
 <400> 140
 tcgtaacgtc tcgtgacc 18

```

<210> 141
<211> 20
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 141
ggagatcttt ctagagtgag
20

<210> 142
<211> 21
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<220>
<221> misc_feature
<222> (10)..(10)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (19)..(19)
<223> n is a, c, g, or t

<400> 142
ccttggtgan tctatccgna g
21

<210> 143
<211> 25
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<220>
<221> misc_feature
<222> (17)..(17)
<223> n is a, c, g, or t

<400> 143
ctgccactgc tagttgngat aatcc
25

<210> 144
<211> 25
<212> DNA
<213> artificial

<220>

```


<223> description of artificial sequence: primer

<400> 144
gggcttctaa gcgacccaga tcttg 25

<210> 145
<211> 27
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 145
gaatttcctt atggacaagc tctgtgc 27

<210> 146
<211> 25
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 146
gctcaacctc atcacatact aaccc 25

<210> 147
<211> 25
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 147
gctcaacctc atcacatact aaccc 25

<210> 148
<211> 27
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 148
gagatgggcg ggcaagtgcg gcaacag 27

<210> 149
<211> 28
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 149
gcctttgcaa tcaggatcca aatttggg 28

<210> 150
<211> 24
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 150
ctgctgcagt tcaggaaaca tcag 24

<210> 151
<211> 22
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 151
accgatgtg ctcacagaac tg 22

<210> 152
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 152
ttaaccagca aagtgtta 18

<210> 153
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 153
ttaaccagca aagtgtta 18

<210> 154
<211> 21
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 154
ttagggcaag agatggtaag g 21

<210> 155
<211> 19
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 155
ttataacaat gatggaggg 19

<210> 156
<211> 21
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 156
cattaaaaag ggcacagacg c 21

<210> 157
<211> 17
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 157
tggacattct ccgcagt 17

<210> 158
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 158
cccaccacca gagagaaa 18

<210> 159
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 159
accaccagag agaaaccc 18

<210> 160
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 160
accagagaga aaccacc 18

<210> 161
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 161
agagagaaac ccaccacc 18

<210> 162
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 162
gagaaaccca ccaccaga 18

<210> 163
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 163
aaaccaccca ccagagag 18

<210> 164
<211> 18
<212> DNA
<213> artificial

<220>
<223> description of artificial sequence: primer

<400> 164	
ggaggcaagc gaacgcaa	18
<210> 165	
<211> 18	
<212> DNA	
<213> artificial	
<220>	
<223> description of artificial sequence: primer	
<400> 165	
ggcaagcgaa cgcaagga	18
<210> 166	
<211> 9	
<212> RNA	
<213> metapneumovirus	
<400> 166	
gggacaagu	9
<210> 167	
<211> 9	
<212> RNA	
<213> metapneumovirus	
<400> 167	
gggauaaaau	9
<210> 168	
<211> 9	
<212> RNA	
<213> metapneumovirus	
<400> 168	
gagacaaaau	9
<210> 169	
<211> 9	
<212> DNA	
<213> APV	
<400> 169	
aggaccaat	9
<210> 170	
<211> 9	
<212> DNA	
<213> APV	
<400> 170	
gggaccagt	9

<210> 171
<211> 9
<212> RNA
<213> APV

<400> 171
uaguuaauu

9

<210> 172
<211> 7
<212> RNA
<213> artificial

<220>
<223> decription of artificial sequence: consensus sequence

<400> 172
uaaaaaah

7